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DAIRY, FOOD AND ENVIRONMENTAL

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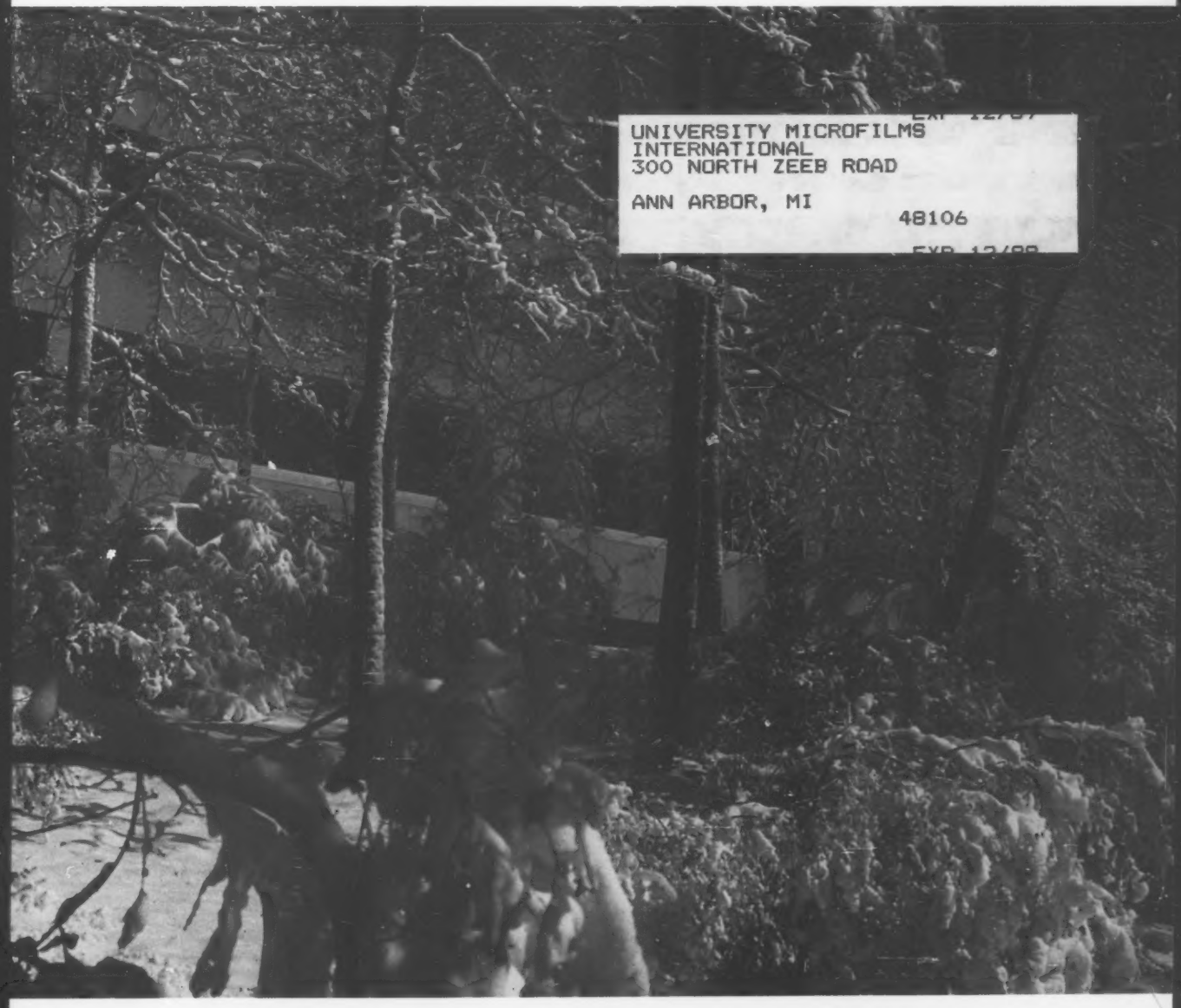

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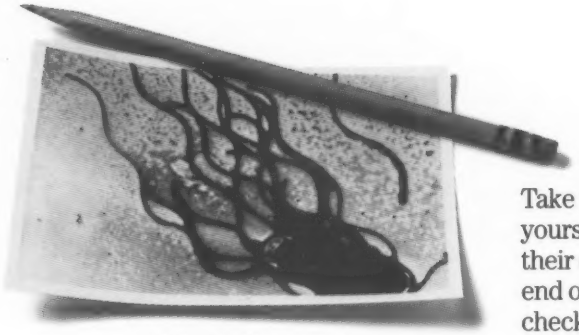

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Thoughts From the President . . .

By

Robert B. Gravani, Ph.D.

I hope that you and your family had an enjoyable holiday season and a good New Year.

The new year traditionally is the time when we all "start over" and write out our ambitious list of resolutions or goals for the coming months. I hope that in addition to your personal, family and community goals, one of your professional goals is to become more actively involved in one of your professional associations - IAMFES to be exact. Active and involved members are the strength of any professional organization!

Your Executive Board members are hard at work on their 1989 goals. Here's what they're concentrating on:

- Leon Townsend is currently coordinating efforts to complete an IAMFES Policy Manual. This manual will be invaluable to new board members, committees, interested association members and the Ames office staff.

- Ron Case is Annual Meeting Program Chairman and is actively involved in planning the 76th Annual Meeting program in Kansas City on August 13-17, 1989. He is working with a newly created Program Advisory Committee chaired by Dr. Edmund Zottola. This year's program promises to be the best yet!

- Bob Sanders is working with the 24 IAMFES committees. He is providing assistance to committee chairs as they formulate their goals for the coming year and conduct their important activities.

- Damien Gabis is assisting the Ames office staff with financial planning, record keeping and office administration.

- Bill Coleman is concentrating on improving executive board communications with IAMFES affiliates. In a recent letter to affiliate presidents, Bill mentioned that IAMFES board members would be interested in being included as speakers on affiliate programs (as schedules and financial arrangements permit).

As you can see, your Board is striving to continue the fine IAMFES traditions and programs and strengthen the already strong association. We can do it with your help!

Best wishes for a Happy, Healthy and Prosperous 1989.

Robert B. Gravani, Ph.D.
IAMFES President
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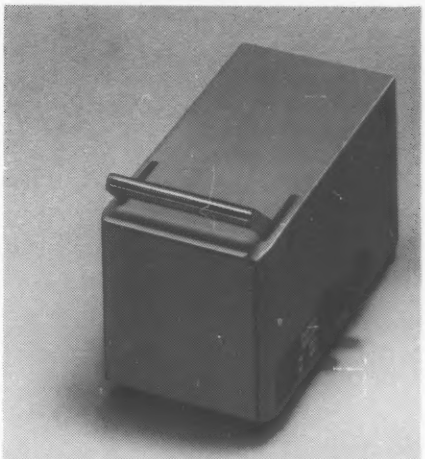

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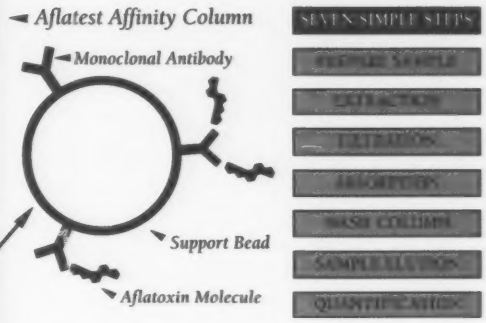

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A Study of Control of Infra-Red Instruments Used in Analysis of Various Components of Raw Milk

by
Roy Ginn[1] and Vernal Packard[2]

Abstract

Eleven laboratories using twelve infra-red instruments were monitored over a 48-week period to determine the accuracy and reproducibility in component analysis of milk. Each laboratory received and analyzed one set of twelve control samples weekly. "Adjusted" results were reported back to the authors for statistical analysis by laboratory/instrument and by sample. Mean difference and standard deviation of the differences between infra-red and control samples averaged well under Association of Official Analytical Chemists (AOAC) standards. Deviations from controls were generally somewhat higher at very low and very high component levels. Between-laboratory variability for all components was found to fall essentially within AOAC standard deviation standards for *within*-laboratory control.

Introduction

Proper calibration and control of infra-red instruments is critical to the process of ensuring accurate measurement of components used in milk purchase plans. Present control procedures center on assembly of milk samples widely ranging in component level, analysis of these samples by officially recognized reference methods, then comparative analysis of these same samples on infra-red instruments. Data thus obtained can be used to determine both precision (repeatability) and accuracy (agreement with reference results) of infra-red testing devices.

Control samples may be assembled and analyzed either by individual dairy plants or by one "centralized" laboratory which in turn distributes them to other dairy plants. The latter method offers advantages both in reduced cost of sampling and testing, and also in improved agreement between different laboratories (*6*).

Dairy Quality Control Institute, Inc. (DQCI) began providing control samples to the dairy industry in 1984. Since then, reference analyses have been evaluated (*7, 9, 10*), some adjustments made in procedures, and number of control samples expanded from ten, originally, to twelve at present. A recent survey (*11*) indicated general improvement in control in nine participating laboratories over the three years 1984-86. A question yet remains, however, regarding the extent of control possible both within and, particularly, between laboratories operating within a centralized control program.

In April of 1987, DQCI, Inc. organized a special control effort involving eleven laboratories and twelve infra-red instruments. The laboratories participating in the program agreed to accept and test one set of twelve control samples each week and to return their infra-red readings to DQCI for statistical evaluation. The term "adjusted" in this context means that the laboratory analyst was given the option of adjusting infra-red readings to control sample results when and if it was deemed necessary, and then reporting the "adjusted" rather than initial readings. In return, the laboratories received a sample by sample statistical analysis of results on a weekly basis and, in addition, a summary of results by laboratory on a quarterly (12-week) basis. As such, these laboratories have served as guarantors of the quality of each batch of control samples that reaches distribution channels. At the same time, the data generated by these laboratories provide sound evidence of the potential of infra-red testing of milk components, both within and between laboratories. The results reported herein summarize findings over the first 48 weeks of operation of this monitoring group.

Material and Methods

Eleven laboratories representing twelve infra-red instruments analyzed twelve control samples of milk each week for 48 weeks. The control samples were tested by the Mojonnier method for fat, Tecator macro Kjeldahl apparatus (Tecator, Inc., P.O. Box 405, Herndon, Virginia 22020) for protein, and High Performance Liquid Chroma-

[1]*Dairy Quality Control Institute, Inc., 2353 N. Rice Street, St. Paul, MN 55113*
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tography (HPLC) for lactose (*3*). Total solids were analyzed by Method 1, Association of Official Analytical Chemists procedure (*1*). Solids-not-fat (SNF) was determined by difference (total solids minus fat).

The laboratories were aware of the reference test results and were asked to use the samples as they normally would in their on-going control program. If analyses indicated the need for adjustment of the infra-red instrument, the technician was asked to make the adjustment and to retest the control samples. In all cases, the laboratories were requested to return to DQCI, Inc. the results of "adjusted" analyses of each control sample for each of five components (fat, protein, lactose, SNF and total solids).

Most of the participating laboratories are located in the upper midwest (Minnesota, Wisconsin and Iowa). One is located in Pennsylvania. All of them had previously calibrated their infra-red instruments on DQCI, Inc. control samples.

Results and Discussion

Table 1 provides a summary of the average infra-red and control (reference) sample test results and the difference between them for eleven laboratories (twelve instruments) over 48 weekly analyses of twelve different control samples and five components of milk. The difference between infra-red and control samples results all fall within the second or third decimal point, and well within Association of Official Analytical Chemists (AOAC) standards for mean difference for the two sets of results.

If there is a trend in the difference values, it is one of somewhat greater magnitude at very low and very high component levels, with positive bias more often noted at the former, a negative bias at the latter extremes. This tendency is to be expected and can only be minimized by calibrating and maintaining calibration of infra-red instruments over a wide range of component levels. That the difference values noted in Table 1 are as small as they are is indicative of tight control over all components at all ranges.

Because milk components vary on a seasonal basis both in amount and, to some extent, chemical composition, the data collected over 48 weeks were divided and analyzed in 12-week (quarterly) segments. These results are shown in Table 2. The data are expressed in the statistical terms required by AOAC, i.e. mean difference and standard deviation of the difference between infra-red and control sample results. The mean difference may be considered a measure of the degree and direction of bias. The standard deviation of the difference is a measure of instrument variability. It expresses the degree to which instrument values vary, both positively and negatively, from the control sample results. A value of 0.03 for example, indicates an instrument agreement with the references results of ± 0.03% in approximately two-thirds of the analyses. That value multiplied by 1.96 reflects the agreement of 95% confidence. In the example given, the instrument result would fall with ± 0.059% of the reference result 95 times out of 100.

TABLE 1. *Average and difference between the average of infra-red vs reference samples in a 12-sample infra-red monitoring program*[a].

	SAMPLE NUMBER											
	1	2	3	4	5	6	7	8	9	10	11	12
FAT (%)												
Infra-red	2.523	3.231	3.516	3.722	3.937	4.663	3.235	3.518	3.739	3.950	4.642	5.768
Control	2.515	3.231	3.506	3.709	3.929	4.638	3.221	3.511	3.725	3.943	4.627	5.750
Diff.	0.008	0.000	0.010	0.013	0.008	0.025	0.014	0.007	0.014	0.007	0.015	0.018
PROTEIN(%)												
Infra-red	3.246	3.184	3.164	3.231	3.219	3.833	3.177	3.168	3.244	3.266	3.164	3.974
Control	3.231	3.174	3.170	3.234	3.213	3.853	3.173	3.185	3.243	3.269	3.154	3.986
Diff.	0.015	0.010	-0.006	-0.003	0.006	-0.020	0.004	-0.017	0.001	-0.003	0.010	-0.012
LACTOSE (%)												
Infra-red	4.842	4.791	4.784	4.820	4.787	4.813	4.793	4.765	4.813	4.782	4.784	4.757
Control	4.864	4.789	4.778	4.803	4.790	4.801	4.782	4.759	4.803	4.781	4.778	4.745
Diff.	-0.022	0.002	0.006	0.017	-0.003	0.012	0.011	0.006	0.010	0.001	0.006	0.012
SNF (%)												
Infra-red	8.823	8.686	8.658	8.751	8.714	9.391	8.679	8.643	8.769	8.760	8.640	9.456
Control	8.806	8.679	8.659	8.750	8.716	9.410	8.670	8.649	8.767	8.765	8.652	9.508
Diff.	0.017	0.007	-0.001	0.001	-0.002	-0.019	0.009	-0.006	0.002	-0.005	-0.012	-0.052
TOT. SOL. (%)												
Infra-red	11.344	11.919	12.172	12.473	12.651	14.048	11.913	12.162	12.439	12.709	13.281	15.223
Control	11.322	11.911	12.180	12.436	12.644	14.048	11.892	12.160	12.494	12.708	13.280	15.259
Diff.	0.022	0.008	-0.008	0.037	0.007	0.000	0.021	0.002	-0.055	0.001	0.001	-0.036

[a]Each of 12 infra-red instruments in eleven different laboratories were monitored at weekly intervals over 48 weeks.

In order to better understand the data in Table 2, it is perhaps well to indicate the AOAC standards for the specific statistical values given. The mean difference, in this regard, should not exceed 0.05% for fat, protein, and lactose, and 0.09% for total solids. The standard deviation of the difference should not exceed 0.06% for the three former components and 0.12% for the latter. These are measures of accuracy -- agreement between instrument and reference results.

Values in Table 2 all fall well below the AOAC standards, both in mean difference and standard deviation of the difference of all components. Seasonal trends appear to be negligible for the most part. Although AOAC has not established standards for solids-not-fat (SNF), the values, as might be expected, are somewhat higher than those for fat, protein and lactose and somewhat lower than those for total solids. A slight negative bias is also apparent. All SNF values were determined by difference (total solids minus fat).

Data in Table 2 shows a striking similarity in general level of agreement between infra-red and reference test results for fat, protein and lactose. All three components over all seasons show mean differences of 0.01 or less and standard deviation of the difference values of 0.03 - 0.04. Variability in fat test appears slightly lower than that of either protein or lactose. The results overall indicate a control potential well below the maxima suggested by AOAC, at least on average.

Data in Table 3 show how well individual instruments/laboratories are able to perform. The data is given in terms of standard deviation of the difference from control results. In this regard, laboratories were able to produce deviations in milkfat analyses of 0.022, at best, and 0.046 at worst. Most were operating in about the 0.030 level of agreement. Protein deviations ran slightly higher and are similar to lactose results. As expected, SNF and total solids deviations are higher than those for fat, protein and lactose, but, with one exception, well within AOAC standards. The one exception, laboratory/instrument number 7, shows a deviation of 0.151 for SNF and 0.137 for total solids. The latter is reasonably close to the AOAC standard of 0.12%. Still, the average is higher than the standard and considerably higher than the output of other instruments. No explanation is known nor offered except to point out the generally poorer control in protein analyses of this one instrument, a fact that would be reflected in both SNF and total solids readings. Again, however, results overall appear most satisfactory.

Little data exists to indicate between-laboratory agreement (variability) in infra-red component analyses in commercial laboratories. One group of workers (*6*), however, have shown the improvement that can be obtained in a centralized system. In their work, the percentage of analyses varying by more than 0.1% in fat and protein test results decreased from 37% and 39% respectively, to 4.2% and 0.7%, respectively, on a centralized program involving 19

TABLE 2. *Mean difference and standard deviation of the difference between infra-red and reference sample results[a] of analyses of various components of raw milk.*

	FAT		PROTEIN		LACTOSE		SNF		TOTAL SOLIDS	
Quarter of Year	Mean Diff.	S.D. Diff.	Mean Diff.	S.D. Diff.	Mean Diff.	S.D. Diff.	Mean Diff.	S.D. Diff.	Mean Diff.	S.D. Diff.
Spring	.013	.031	.001	.038	.007	.037	-.007	.052	.007	.060
Summer	.010	.035	-.006	.039	.001	.037	-.004	.056	.005	.064
Fall	.009	.031	-.003	.036	.001	.037	-.006	.056	-.004	.079
Winter	.010	.029	.000	.031	.007	.032	-.003	.047	-.001	.058
Gr'd Avg.	.011	.032	-.002	.036	.004	.036	-.005	.053	.002	.065

[a]Twelve different IR instruments in eleven different laboratories were monitored over 48 weeks using a set of 12 control samples provided on a weekly basis.

TABLE 3. *Average standard deviation of the difference from reference samples of twelve infra-red instruments in eleven laboratories analyzing five different components of milk*[a].

Instrument No.	Component				
	FAT	PROTEIN	LACTOSE	SNF	TOT. SOL.
1	.030	.037	.036	.041	.053
2	.031	.037	.029	.033	.043
3	.034	.034	.033	.049	.060
4	.031	.037	.036	.052	.069
5	.028	.038	.029	.032	.047
6	.026	.036	.044	.036	.047
7	.036	.045	.038	.151	.137
8	.030	.034	.032	.045	.061
9	.031	.033	.030	.051	.062
10	.035	.032	.034	.050	.071
11	.046	.033	.046	.036	.065
12	.022	.034	.042	.061	.071

[a]Infra-red instruments were monitored on a weekly basis over 48 weeks.

TABLE 4. *Between-laboratory standard deviation in infra-red analyses of various raw milk components in a 12-sample control program*[a].

	SAMPLE NUMBER											
	1	2	3	4	5	6	7	8	9	10	11	12
FAT:												
Avg. Test	2.523	3.231	3.516	3.722	3.937	4.663	3.235	3.518	3.739	3.950	4.642	5.768
Std. Dev.	0.035	0.027	0.029	0.030	0.032	0.042	0.029	0.028	0.029	0.033	0.041	0.063
PROTEIN:												
Avg. Test	3.246	3.184	3.164	3.231	3.219	3.833	3.177	3.168	3.244	3.266	3.164	3.974
Std. Dev.	0.031	0.027	0.027	0.032	0.030	0.042	0.028	0.032	0.029	0.028	0.037	0.045
LACTOSE:												
Avg. Test	4.842	4.791	4.784	4.820	4.787	4.813	4.793	4.765	4.813	4.782	4.784	4.757
Std. Dev.	0.046	0.036	0.040	0.036	0.034	0.044	0.036	0.040	0.033	0.036	0.042	0.060
SNF:												
Avg. Test	8.823	8.686	8.658	8.751	8.714	9.391	8.679	8.643	8.769	8.760	8.640	9.456
Std. Dev.	0.099	0.069	0.061	0.065	0.070	0.083	0.071	0.059	0.070	0.062	0.091	0.113
TOT. SOL.												
Avg. Test	11.344	11.919	12.172	12.473	12.651	14.048	11.913	12.162	12.439	12.709	13.281	15.223
Std. Dev.	0.100	0.073	0.066	0.068	0.076	0.092	0.078	0.065	0.078	0.069	0.096	0.117

[a]Twelve infra-red instruments in eleven laboratories were monitored on a weekly basis over 48 weeks.

laboratories. These workers drew no distinction between agreement at given levels of component(s).

Data in Table 4 provide a summary of between-laboratory agreement for five components of milk over a wide range of component levels. These results reflect an average of eleven laboratories (12 instruments) over 48 weekly trials. [1]A standard deviation of the difference between laboratories is used as a basis for establishing level of agreement/variability.

First, please note that these laboratories were able to achieve a between-laboratory agreement for all components the equal or better than AOAC standards for *within*-laboratory agreement between infra-red and reference results. The single deviation most near the maximum of these standards occurs in total solids, where the value is 0.117 (compared to 0.12 as the standard). Again, it is emphasized that the comparison being drawn relates between-laboratory results to maxima standards for accuracy *within* a given laboratory.

Secondly, it is also apparent that between-laboratory agreement is somewhat poorer at very low and very high component levels than for levels ranging between the extremes. This is not an unexpected result and follows rather directly what has been shown to occur within laboratories. Still it is important to note that between-laboratory agreement for total solids, the most variable component in analytical terms, was 0.1 and 0.117 at levels of 11.344% and 15.223%, respectively. Even at these extremes, laboratories were able to agree to within ± 0.20 - 0.24% 95 times out of 100. Using the same measure of performance, the laboratories agreed to within ± 0.13% at a total solids average level of 12.16%. Agreement in analysis of fat ran between ±0.057 and 0.12%, and for protein ± 0.057 and 0.09%, again at 95% confidence. Between-laboratory variations in lactose analyses appear to run slightly higher than those of either fat or protein, but well under those for SNF or total solids.

In overview, the results of this work suggest that laboratories should be able to operate well within AOAC standards of accuracy (infra-red vs reference test results). At the same time, laboratories should find it possible to agree on test results on major milk components at statistical performance levels not far removed from the maxima established for accuracy within laboratories. These findings agree well with and, in some cases, exceed expectations of previous work by the authors and also the work of others (*2, 3, 4, 5, 8*).

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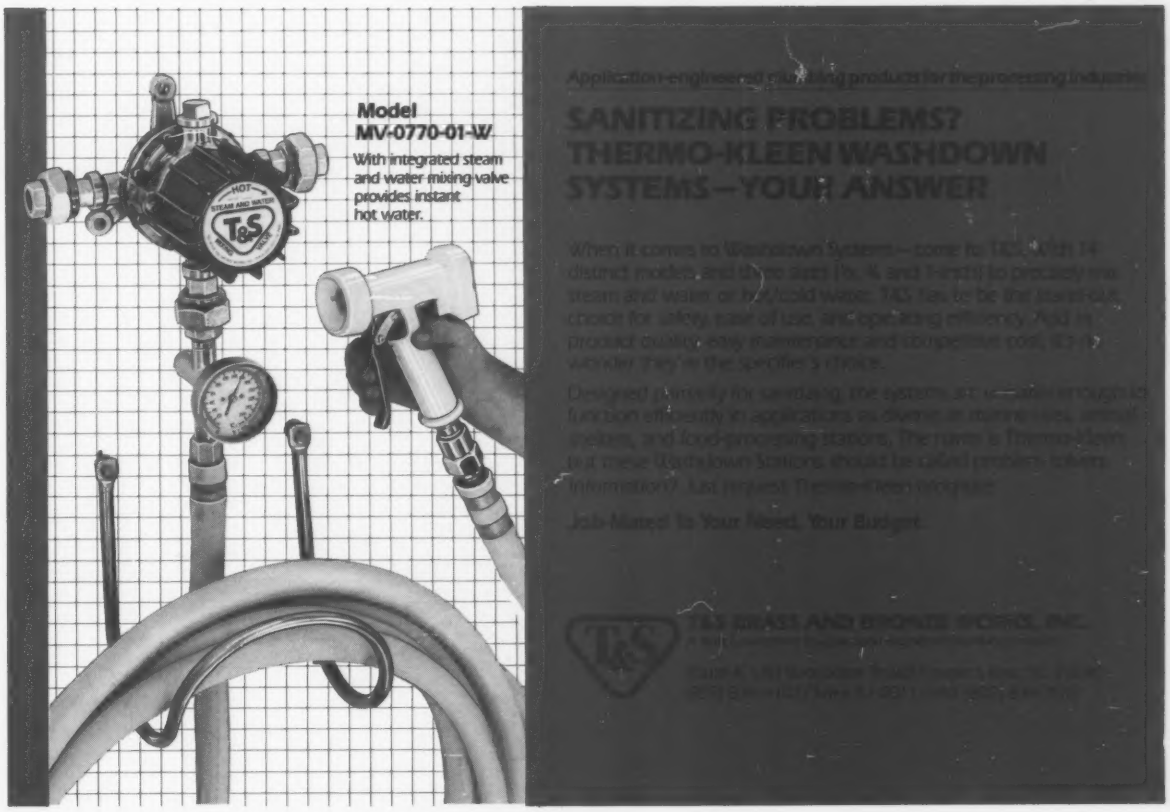

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America's Food Safety Team: A Look at the Lineup

by
Vern Modeland

A member of FDA's Public Affairs Staff

So there's a bug in your Brie. Understandably, you feel like telling someone, since the label didn't say anything about bugs. But who can help? Is it a wild bug or a domestic one? Does it swim? Was the Brie homemade or imported? Did the others at your party also get a bug in their Brie or were you the only lucky one? Is eating bugs good for you? Who's in charge here?

Reponsibility for monitoring and regulating the origin, composition, quality, safety, weight, labeling, packaging, marketing and distribution of the food you eat and drink is shared by local, state, national and international government agencies. On these pages are condensed descriptions of the principal ones involved and a brief explanation of their roles and relationships.

U.S. Department of Agriculture (USDA)

Through inspection and grading, the U.S. Department of Agriculture enforces standards for wholesomeness and quality of meat, poultry and eggs produced in the United States. USDA also is involved in nutrition research and in educating the public about how to choose and cook foods and how to manage healthy or restricted diets.

USDA food safety activities include inspecting poultry, eggs, and domestic and imported meat; inspecting livestock and production plants; and making quality (grading) inspections for grain, fruits, vegetables, meat, poultry and dairy products (including Brie and other cheeses). USDA's education programs target family nutritional needs, food safety, and expanding scientific knowledge. The department supports education with grants in food and agricultural sciences and conducts its own and cooperative food research.

Bureau of Alcohol, Tobacco and Firearms (ATF)

ATF, an agency of the Department of the Treasury, is responsible for enforcing the laws that cover the production, distribution and labeling of alcoholic beverages, except wine beverages that contain less than 7 percent alcohol, which are the responsibility of FDA. ATF and FDA sometimes share responsibility in cases of adulteration, or when an alcoholic beverage contains food or color additives, pesticides or contaminants.

Centers for Disease Control (CDC)

A branch of the Department of Health and Human Services, CDC becomes involved as a protector of food safety, including responding to emergencies, when food-borne diseases are a factor. CDC surveys and studies environmental health problems. It directs and enforces quarantines, and it administers national programs for prevention and control of vector-born diseases (diseases transmitted by a host organism) and other preventable conditions.

Department of Justice

When the problem with a food is a violation of federal law, marshals from the Department of Justice are the agents who seize products. The Justice Department's attorneys take suspected violators of food safety laws to court.

Environmental Protection Agency (EPA)

Among its many duties, EPA regulates pesticides. It determines the safety of new pesticide products, sets tolerance levels for pesticide residues in foods, which FDA enforces, and it publishes directions for the safe use of pesticides.

EPA also establishes water quality standards, including the chemical content of drinking water. These standards are used by FDA as guides in its regulations of bottled water sold in interstate commerce for human use.

Federal Trade Commission (FTC)

FTC's Bureau of Consumer Protection has, among its duties, the regulation of advertising of foods.

Food and Drug Administration (FDA)

FDA, a part of the Department of Health and Human Services' Public Health Service, is responsible for ensuring the safety and wholesomeness of all foods sold in interstate commerce except for meat, poultry and eggs, all of which are under USDA jurisidiction.

FDA develops standards for the composition, quality, nutrition and safety of foods, including food and color additives. It does research to improve detection and prevention of food contamination. It collects and interprets data on nutrition, food additives and environ-

mental factors, such as pesticides, that affect foods. FDA also sets standards for certain foods and enforces federal regulations on labeling, food and color additives, food sanitation, and safety of foods.

FDA inspects food plants, imported food products, and feed mills that make feeds containing medications or nutritional supplements for animals destined as food for humans. FDA monitors recalls of unsafe or contaminated foods and can get illegally marketed foods seized.

National Marine Fisheries Services (NMFS)

A part of the Department of Commerce NMFS is responsible for seafood quality and identification, fisheries management and development, habitat conservation, and aquaculture production. NMFS has a voluntary inspection program for fish products. Its guidelines closely match regulations for which FDA has enforcement authority.

State and Local Governments

State and local government agencies cooperate with the federal government to ensure the quality and safety of food produced within their jurisdictions. FDA and other federal agencies help states and local governments develop uniform food safety standards and regulations, and assist them with research and information.

States inspect restaurants, retail food establishments, dairies, grain mills, and other food establishments within their borders. In many instances, they can embargo illegal food products, which FDA cannot do. States "own" fishing waters within their jurisdictions, which gives them authority over fish, including shellfish, taken from those waters. FDA provides guidelines to the states for this regulation. Twenty-eight states have their own fish inspection programs.

FDA also provides guidelines for state and local governments for regulation of dairy products and restaurant foods.

The departments responsible for food safety and inspection functions vary by state and community. Some are divisions of other agencies such as state agriculture or health departments.

Foreign Governments

Governments of at least 40 nations are now partners with the United States in ensuring food safety through memoranda of understanding that cover some two dozen food products, including shellfish. International cooperation is expanding in areas of food product inspection, certification, quality assurance, education and training, product studies, and regulatory standards.

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Fish Market Guidelines Tested in Retail Food Stores

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Abstract

After several requests from retail stores for sanitation guidelines for operating a fish seafood market, the Joplin, Missouri Health Department researched and developed a set of proposed guidelines. The Health Department then embarked on a study to obtain information concerning quality and shelf life of fresh and frozen/thawed fish. Three areas were considered in the study: (A) Quality of products received; (B) Store handling practices; and, (C) Product quality during the time it remained in the retail fish market. Based on the results of the study completed at three retail stores in Joplin the initial guidelines presented the retailers were evaluated and modified to be consistent with the findings.

After several retail stores in Joplin, Missouri requested information from the Health Department on how to determine the quality of fresh and frozen/thawed fish and fish products, the Health Department embarked on a study of those products in three retail food stores in the city. Agreements were signed between the Health Department and the stores on how the study would be conducted. The study covered the bacterial, visual and odor characteristics of the fish products from time of arrival at the store until the end of shelf-life at three retail stores. It also evaluated the storage and handling practices of the food store personnel with relation to different species and forms of fish and fish products. The Health Department agreed to interpret and amend the proposed guidelines to be consistent with the results of the study and provide the stores with recommendations based on the results of the study, and the stores agreed to provide samples and comply with the recommendations.

A questionnaire was developed to obtain information on suppliers and handling practices. An inspection sheet was designed to evaluate the collection and analysis of samples, fish characteristics, store sanitation, and temperatures.

The store questionnaire was filled out by the manager of the fish department in each of the three stores, detailing the dates and times the fish and fish products arrived, temperature of the products at the time of arrival, the length of time the fish were handled out of refrigeration, and the anticipated shelf life within the stores. The questionnaire also was designed to obtain information on the handling practices of store personnel upon receipt, during storage, processing and display. The names and addresses of suppliers, catch date information and suggested shelf-life for the product were also requested.

The inspection sheet provided for obtaining information on the temperature and sanitation of equipment in the store and the work areas. Handling practices, temperature, visual appearance and odor characteristics of each sample were recorded on the inspection sheet.

At each of the retail stores prior to conducting the study the fish market manager and store manager discussed with health department officials the procedures for conducting the study. It was agreed and the retail store ordered a sufficient quantity of fish to meet the customer demand and the needs of the study. The fish products included a fat and lean fish, fresh and frozen fish of the same species provided the supplier was able to fill the store order. The retail store management and the Health Department believed this would be an adequate comparison of products, i.e., a fresh fat fish to a frozen/thawed fat fish, both the fish being the same species and the same procedure with a lean fish species. It was further agreed that the Health Department would meet the delivery vehicle at the time and date of arrival at the retail store to evaluate and collect samples upon arrival. The fish were handled in accordance with the supplier's recommendations and store policies which were documented in the store questionnaire. Samples were collected each day at the same time from the display case. When samples were collected from the full service case, visual and odor observations, the temperature of the case and the temperature of the fish

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products were recorded. The store employee at that point placed the sample in a plastic bag as if prepared for a customer. The sample was then placed in a refrigerated container to maintain the transporting temperature of 32 degrees Fahrenheit to the laboratory.

The self-service display case contained fish in prewrapped packages which were collected as if a customer would pick a package of fish to purchase. The temperature of the display case was recorded first, then the temperature of the fish sample was recorded while in the display case. Then the visual and odor observations were recorded and the samples were transported to the laboratory as described above.

The sampling technique was coined "Random Consumer Sampling," and designed to evaluate the actual product received by a consumer. The maximum allowable aerobic plate count of colonies of bacteria per gram of raw meat was defined by the *Division of Health of Missouri State Laws Accompanied by The Division of Health Rule and Administrative Guidelines Governing The Manufacture, Sale and Distribution of Foods*, to be 1,500,000 (*3*). This number was applied for use in determining the acceptability of the fish products sampled in this study. All samples were deemed to be representative of a fish the consumer would have purchased on the same day of collection for analysis.

The study consisted of a testing period of approximately five days at each location. Samples collected were fresh and frozen/thawed portions of a lean fish species and a fat fish species (described in the Seafood Nutrition Chart of the *Restaurant Guide to Seafood* by Louisiana State University) (*6*) collected at twenty-four hour intervals.

The fish samples were analyzed for standard plate counts, *Staphylococcus aureus, Escherichia coli, Salmonella* spp. and *Shigella* spp. by the Biology Department of Missouri Southern State College. The aerobic plate count method was chosen to obtain the total numbers of bacteria present in the sample. Testing for staphylococcus, escherichia, salmonella and shigella was done to evaluate possible contamination problems in handling. Analysis was done following the *FDA Bacteriological Analytical Manual* procedures (*4*).

Initial samples obtained at Store A showed unacceptable bacterial counts at the time the fish arrived at the store. However, based on visual and odor observations the products were marketable for one or two days. No time/temperature record was available for the products received at Store A from catch time until receipt. A fat fish was not available for testing at this location. Store A had established a five day in-store shelf-life. The average temperature of the fresh and frozen/thawed fish sampled at Store A was 38 degrees Fahrenheit. The frozen/thawed ocean perch exhibited an explosive growth of bacteria commencing on the 3rd day.

Products received at Store B were analyzed upon arrival and showed standard plate counts well below the maximum allowable 1,500,000. By the fourth day, the plate count for fresh salmon had risen to 1,400,000, while samples from other fish were still below the maximum. However, the latter had reached the point where the visual and odor characteristics no longer allowed the products to be marketable. Store B had established a three day in-store shelf-life for fish. This three day shelf-life for fresh fish is consistent with the information gained in a study done by the Rhode Island Department of Health in 1982 (*7*). Although the frozen/thawed products had normal bacterial growth rates and lower standard plate counts than the fresh products, the visual and odor characteristics deteriorated more rapidly.

In evaluating the fish at Store C upon arrival, high bacterial counts were found, and unacceptable visual and odor characteristics had already developed. Store C had established a seven day in-store shelf-life. The average temperature of the fresh and frozen/thawed fish samples at Store C was 34 degrees Fahrenheit. At this store, fresh salmon had a shelf-life of two days; frozen/thawed sea trout a shelf-life of less than 24 hours; and the fresh pollock was not acceptable at the time of arrival. Frozen/thawed cod had a shelf-life of less than 24 hours. Both the frozen/thawed products had irregular bacterial growth patterns. No time/temperature monitoring was done during the delivery of fish to Store C.

Discussion

It may be assumed that fish and fish products have been harvested, processed and packaged according to sanitary guidelines acceptable for shipment to inland states; however, it is nearly impossible to determine the exact time that has elapsed from catch date to arrival at an inland market because of the number of food brokers and transportation systems involved. Also, it cannot be assumed that the fish and fish products in each box or package received at the fish market are from the same catch. It appeared that some of the frozen/thawed fish had bacterial growth patterns indicative of products frozen at the end of their fresh shelf-life.

It is generally accepted that the best way for a retailer to insure that he is merchandising a good product is to purchase from a reputable supplier. If a broker is going to guarantee his product for a given number of days, then he will have to know the approximate catch date. It has been demonstrated that the fish flesh will degenerate on a time temperature continuum. As a supplier, he must know how long and at what temperature his products have been stored in order to make a statement about the remaining shelf-life. From the NIFI Educational Foundation training manual it is suggested that, at the very least, the food service operator should investigate suppliers from time to time and ask to inspect their facilities (*5*). Generally, the shelf-life of fish in a retail market is based on the enzyme activity which breaks down the fish flesh. The cells autolyse due to the release of acid hydrolase enzymes from the lisosomes. Histologically, the lisosomes have been described as a group of cytoplasmic particles with a single limiting membrane and no internal structure, which con-

tain acid hydrolase activity. When investigated by microscopic and histochemical methods, the distribution of lysosomes and of lysosomal acid hydrolase activities in normal muscle is sparse and thus may account for the occasional report of their absence in normal vertebrate muscle (*2*). If the source of enzymes responsible for the breakdown of the fish flesh is not the cells themselves then it must be from another source. It is possible that some of the organ cells rich in lysosomes impregnate the skeletal muscle during the processing.

The primary source of enzyme activity is from the surface bacteria introduced to the flesh during the cleaning and handling process. The bacteria responsible for fish spoilage during refrigerated storage are principally gram-negative (*7*). Gram-positive bacteria excrete various exoenzymes into the medium (the fish flesh). Most of these enzymes (e.g., proteases, nucleases) convert impermeable substances into permeable foodstuffs. Gram-negative bacteria may release exotoxins to the medium, but most of their excreted protein are retained in the periplasmic space, between the inner and the outer membrane (*1*). This retention lends credibility to rinsing of the fish to remove the bacteria as a means on increasing shelf-life.

Decomposition of fish flesh after death is rapid; however, bacteria and enzyme activity is greatly affected by temperature and handling practices. Chilling temperatures from 29 degrees Fahrenheit to 32 degrees Fahrenheit retards the activity. Freezing at 9 degrees Fahrenheit slows down the activity even further. Temperatures of 35 degrees Fahrenheit and above accelerate the enzyme and bacterial action in fish. In addition to enzymatic breakdown, the oxidation of fatty fish produces malodor and flavor. This condition may or may not be harmful.

In this survey, since no time/temperature monitors were included with the fish received at Stores A and C, it was impossible to determine whether the high bacteria counts were due to temperature violations during transportation or contamination by the supplier or shipper. The quality of the fish received at these stores was not at a desirable level for selling to consumers.

At the store level, temperature of the product is the crucial factor in maximum shelf-life. According to the Food Market Institute, most predictions of shelf-life are calculated at 32 degrees Fahrenheit. If a product has a shelf-life of 14-15 days at 32 degrees Fahrenheit, that would drop to six days when the product is held at 42 degrees Fahrenheit. No supplier can guarantee a shelf-life without knowing the catch date. The handling practices of his source and his own operation also figures into that determination.

At Store B, differences were observed between the fatty salmon and the lean sole. There was more discoloration on the salmon and more separation of the flesh; there was more drying out and more malodor to the sole. Frozen/thawed fish had more leaching (loss of fluid) of the product but also lower standard plate count. Assuming the frozen fish were frozen immediately after catching and thawed at the store, they had a total shelf-life of only four days. The fresh salmon had a total shelf-life from catch to sale of nine days. The fresh sole had a total shelf-life from catch to sale of seven days. The frozen/thawed fish in this study had a shorter total shelf-life than fresh fish. Salmon, a fat fish, had a longer total shelf-life than the lean sole, contrary to expectations.

Conclusions

The study of three retail fish markets in Joplin, Missouri, revealed that the quality of fish received at inland markets varies greatly. There was no accountability of how fresh and frozen fish was handled during all phases of transportation. The study also revealed improper handling and processing practices at retail food stores, which added to the loss of shelf-life. The Joplin Health Department adopted guidelines for retail fish markets, with ongoing efforts to improve the product for consumers.

Due to the wide fluctuation in the quality of the shipments received during the testing period, it was recommended to the Missouri Department of Health that further testing be done. It is hoped that a permanent program will be established to monitor the quality of fish entering the Missouri marketplace.

Recommendations

1. All fish shipments should be accompanied by time/temperature monitors from the time of catch until delivery to the retail outlet. Either recording thermometers or color changing temperature sensitive badges may be used.
2. Retail outlets should store fresh fish on ice in a double pan system that will maintain the product between 29 degrees and 32 degrees Fahrenheit.
3. Frozen fish should be thawed only under refrigeration and only in quantities expected to be sold in a 24 hour period. Any frozen/thawed product not sold in that time frame should be handled like fresh fish.
4. For display of an over-wrapped product under dry refrigeration, the display temperature must be maintained below 32 degrees Fahrenheit in order to hold the product at 32 degrees Fahrenheit.
5. Red meat and fish must not be stored in the same refrigeration unit as optimum temperature and shelf-life for both products cannot be reached.
6. A statement from the supplier should be required to testify at what time during the processing of the fish the time/temperature monitor was attached.
7. Store personnel who accept delivery and are responsible for handling fish and fish products should be trained to do delivery inspections and have the ability and authority to accept or reject any shipment based on visual and odor characteristics as well as temperature records. If catch date and temperature records are not available, the product would not be acceptable. An inspection should be made at the central warehouse before redistribution to local stores. An employee of the fish market should meet the delivery vehicle and record the temperature of vehicle and

TABLE 1. *Store A results. Aerobic plate counts as colonies per gram of sample.*

Sample Time	Fresh Ocean Perch	Frozen-Thawed Ocean Perch
0 Hours	49,000,000	11,700,000
24 Hours	105,000,000	16,800,000
48 Hours	890,000,000	47,000,000
72 Hours	912,000,000	92,500,000
96 Hours		295,000,000

Visual and Odor Observations

Fish Species	Average Temp.	Discoloration	Drying Out	Flesh Separation	Odor
Fresh Ocean Perch	38 F	25%	0%	75%	75%
Frozen/Thawed Ocean Perch	38 F	60%	60%	40%	40%

Ocean Perch 1.4% Lean Fish

% = Chance of purchasing a fish exhibiting these characteristics.

TABLE 2. *Store B results. Aerobic plate counts as colonies per gram of sample.*

Sample Time	Fresh Salmon	Frozen/Thawed Salmon	Frsh Sole	Frozen/Thawed Sole
0 Hours	45,910	11,690	312,500	36,440
24 Hours	102,900	72,980	151,900	18,075
48 Hours	308,900	96,780	274,700	24,830
72 Hours	1,426,500	179,500	437,500	87,420

Visual and Odor Observations

Fish Species	Average Temp.	Discoloration	Drying Out	Flesh Separation	Odor
Fresh Salmon	38 F	75%	0%	20%	35%
Frozen/Thawed Salmon	30 F	75%	35%	20%	25%
Fresh Sole	34 F	15%	25%	15%	40%
Frozen/Thawed Sole	29 F	30%	30%	10%	45%

Salmon 5.7% Fat Fish

Sole 1.2% Lean Fish

% = Chance of purchasing a fish exhibiting these characteristics.

TABLE 3. *Store C results. Aerobic plate counts as colonies per gram of sample.*

Sample Time	Fresh Salmon	Frozen/Thawed Sea Trout	Fresh Pollock	Frozen/Thawed Cod
0 Hours	120,000	1,300,000	TNTC 10	280,000
24 Hours	400,000	18,000,000	1,700,000	27,000,000
48 Hours	800,000	11,000,000	2,000,000	8,000,000
72 Hours	800,000	28,000,000	3,100,000	24,000,00

Visual and Odor Observations

Fish Species	Average Temp.	Discoloration	Drying Out	Flesh Separation	Odor
Fresh Salmon	34 F	100%	80%	60%	100%
Frozen/Thawed Sea Trout	34 F	40%	60%	100%	100%
Fresh Pollock	31 F	50%	75%	100%	100%
Frozen/Thawed Cod	34 F	60%	80%	100%	80%

Salmon 5.7% Fat Fish

Sea Trout 3.1% Fat Fish

Pollock 1.3% Lean Fish

Cod 0.6% Lean Fish

% = Chance of purchasing a fish exhibiting these characteristics.

each container of fish. If any of the product is above 35 degrees Fahrenheit that product should be rejected and returned to the supplier. If any of the fish has strong odors, gross discoloration, or flesh separation, these products should also be rejected. More detailed information is contained in the Fish Handling Guidelines.

8. It is recommended that *FDA's Retail Food Store Sanitation Code* (1982) be revised to include specific requirements for fish markets. Standards and procedures should be established for the embargo of fish and fish products.

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110	123	136	149	162	175	188	201	214	227	240	253	266	279	292	305	318	331	344	357
111	124	137	150	163	176	189	202	215	228	241	254	267	280	293	306	319	332	345	358
112	125	138	151	164	177	190	203	216	229	242	255	268	281	294	307	320	333	346	359
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The Scientists Tell Me...

Researchers Investigate New Methods To Reduce Contamination of Raw Meat

by Marilyn Brown
TAES Science Writer

The presence of bacteria and other microorganisms on fresh, raw meats has, in recent years, raised questions regarding the healthfulness of fresh meats. Some consumer activist groups have gone as far as to propose that fresh meats should be labeled as containing disease-causing agents, but such an extreme is highly unnecessary, scientists say. Meats, like any other fresh food, remain healthful with proper care and handling.

Most foods are derived from animals and plants and, thus, are closely associated with the soil, air, and water that surrounds them. Since soil, air, and water contain many types of microorganisms, animals and plants are naturally "contaminated" with microorganisms, some of which are pathogens.

With animal products, microorganisms are found in the gastrointestinal tract and the exterior surfaces, and great care is required during slaughter to avoid contamination of the edible products with these surfaces. The extent of contamination will depend largely upon the sanitary control during slaughter and dressing, says Gary R. Acuff, food microbiologist with the Texas Agricultural Experiment Station. But even the most technologically advanced commercial production and processing practices available will not eliminate all the microorganisms from the surface of the carcass.

Some of the microorganisms that are significant from the public health standpoint include *Salmonella, Staphylococcus, Clostridium, Yersinia, Campylobacter* and *Listeria. Salmonella* contamination of poultry, in particular, has received much media attention of late, though its presence in poultry has long been established. Contaminated feed is the major source of *Salmonella* in poultry.

While industry research focuses on ways to produce pathogen-free feed, consumers can practice good handling to avoid problems with *Salmonella* and other pathogens, Acuff says.

"If meat is handled and treated properly there is no need to fear foodborne illness," the researcher says. "In the first place, one should not consume foods of animal origin without cooking." The risk of contracting disease is greater in raw foods, he says.

Proper handling means that hands, utensils, and surfaces that come into contact with raw products should be thoroughly washed with soap and water before they come into contact with other foods, particularly with those foods that will not receive any further heat treatment.

"It is disturbing that on television cooking shows, food preparers' hands that were in contact with raw animal foods are wiped off on cloths or towels that are subsequently used to dry and recontaminate clean hands after washing with soap and water," the scientist says. Unfortunately, cross-contamination in the kitchen is the norm on national television programs, he says.

Proper cooking will destroy most disease-causing microorganisms, but proper cooling is also important to suppress those microbes that may survive.

"Therefore, when cooling leftovers, it is recommended that a temperature of 60 degrees is reached within two hours, and that a temperature of 45 degrees is reached within an additional four hours," Acuff says. "Similarly, if foods are reheated, the food should not be held for excessive periods between 60 and 120 degrees, and the food should reach 160 degrees during reheating."

While consumers take care in food preparation, the meat industry can re-examine slaughtering and dressing practices to help reduce the spread of pathogens, Acuff says. Research projects underway include new methods of removing soil from animal surfaces, reducing the risk of carcass contamination during hide removal, showering carcasses with antibacterial rinses, and improving evisceration to eliminate contamination with intestinal microbes.

One method under study, the Nurmi concept, has reduced the occurrence of *Salmonella* in poultry. In this procedure, young chicks are fed pathogen-free fecal material from adult birds. Colonization of the chick's intestinal tract with microorganisms from the adult bird appears to

exclude colonization by *Salmonella*. It is not known whether the method will be useful for other pathogens, according to Acuff.

Irradiation will remove most pathogens from fresh, raw meats, but for irradiation to be successful, a cut of meat would have to be packaged prior to the procedure to protect the food from recontamination. Since not all of the microorganisms would be killed by the irradiation, the product still would require refrigeration or freezing. Consumer acceptance has been an obstacle for irradiation of food products, and the process is not legal for meat preservation in this country.

"Even if irradiation is eventually approved for meat, the logistics of applying this concept are extremely complex. Also, the levels of irradiation currently under consideration for approval may not destroy all the bacteria and parasites present in the meat," Acuff says.

Other treatments, such as antibacterial washes and acid treatment of carcasses and cut meats also are under study. But even if it becomes possible to control or eliminate one set of hazardous biological agents, the future may hold previously unknown foodborne pathogens, Acuff says. Such new pathogens will continue to challenge the imagination of scientists and will maintain the need for proper handling and storage of foods, the scientist says.

Editor's Note: Any question regarding this column should be addressed to Science Writer, Department of Agricultural Communications, Texas A&M University, College Station, Texas 77843, refer to column 626.

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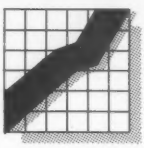

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Listeria

Battling Back Against One 'Tough Bug'

by
Karen J. Skinner, Ph.D.

Something was different. Or so it seemed, as nurse epidemiologist Carol Salminen pored over patient data one March morning in 1985. Her job: spotting trends or unusual occurrences in reports on infections at the Los Angeles County-University of Southern California Medical Center. Her finding: among pregnant Hispanic women entering the hospital with fever, and some of the infants born to them, a cluster of cases of bacterial infection with *Listeria monocytogenes*. The result: an intriguing public health investigation that ultimately linked Mexican-style soft cheese with the infections, revealed one of the most serious outbreaks of food-borne illness ever to occur in the United States, and presented disturbing new evidence connecting food to *Listeria* infections in humans.

Actually, there's nothing "new" about the microorganism *Listeria*. Since 1911, scientists have known it infects animals, and in 1929 the first case of human infection was spotted. Moreover, *Listeria* occurs widely in nature.

What's "new" is recognition that *Listeria* infections may be conveyed by food. In earlier times, many believed farm animals transmitted *Listeria* to humans. But as *Listeria* infections appeared in city dwellers, their origins grew more mysterious. The California incident corroborated mounting evidence that food is an important source of the bacteria. Since then, additional food-associated incidents have occurred. Recently, health officials in Switzerland linked numerous cases of *Listeria* infection occurring in that country between 1983 and 1987 with a soft cheese, Vacherin Mont d'Or. All of the cheese associated with these illnesses - which, according to European news reports, included 111 cases and 31 deaths - was made in Switzerland. Now, in February 1988, the Informal Working Group on Foodborne Listeriosis convened by the World Health Organization concluded: "*Listeria monocytogenes* should be considered as an environmental contaminant, whose primary means of transmission to humans is through contamination of foodstuffs at any point in the food chain - from source to kitchen."

Two reasons underlie concerns about food-borne *Listeria*. First, *Listeria* is a "tough bug" - a "macho microbe" within its microscopic world. It resists heat, salt, nitrite and acidity much better than many microorganisms. But perhaps more alarming, it survives and even grows at low temperatures - below 40 degrees Fahrenheit. This means *Listeria* thrives on cold surfaces and takes over where other bacteria have a hard time living, on places like cooling pipes in factories, where condensation may form. It also means *Listeria* has penetrated a traditional line of food safety defense: refrigeration.

Second, the disease caused by *Listeria* - listeriosis - can be very serious or even fatal for certain high-risk groups such as unborn babies, newborns, and those with impaired immune systems. The disease may progress in several ways. In newborns, for example, it may occur as meningitis or as a bloodstream infection. In the unborn, it may lead to abortion, stillbirth or premature labor. In the Los Angeles outbreak, 142 cases of listeriosis led to 47 fatalities, including 19 stillbirths and 10 infant deaths.

Although we don't know the true incidence of listeriosis in the United States, it appears to be relatively rare - about 1,600 cases each year. In comparison, roughly 2 million to 4 million cases of *Salmonella* infection occur annually in the United States, and about 2,000 case of toxic shock syndrome - an infection associated with use of menstrual tampons. The critical point about listeriosis is this: It may occur infrequently, but when it does strike, it's often severe, even fatal, with a mortality rate near 25 percent.

Getting "Tough" With *Listeria*

Because *Listeria* is "tough," the Food and Drug Administration, food producers, and others are responding accordingly to prevent its potential risks to health. In 1986, FDA began looking for *Listeria* in dairy plants and products as part of a larger, fact-finding effort to identify potential microbial safety problems within that industry. FDA discovered *Listeria* in dairy products from approximately 3 percent of the more than 1,000 plants it checked. When *Listeria* was found, the firms involved voluntarily recalled contaminated products and took steps to eliminate the sources of contamination.

To prevent future problems, FDA and industry have been working together intensively to remove potential sources of contamination in dairy plants. The low percentage of products containing *Listeria* strongly indicates that with proper training, sanitation and vigilance, it is possible to prevent *Listeria* problems within dairy plants.

In response to the California outbreak involving Mexican-style soft cheeses, FDA also surveyed the entire U.S. soft cheese industry for micro-

bial safety, covering product such as Brie, Camembert, mozzarella, and Liederkranz. Among roughly 700 samples examined, FDA found less than 1 percent contaminated with *Listeria*. In these cases, the firms involved also voluntarily removed any remaining contaminated products from the market.

At the same time, FDA surveyed imported soft cheeses as well, and quickly became alarmed that significant numbers of foreign entries contained *Listeria*. For this reason, FDA increased its sampling of imports. As it found contaminated products, FDA noted the foreign plants where they had been manufactured and required all subsequent imports of soft cheeses from those facilities to demonstrate - through laboratory testing - that they were *Listeria*-free. In response, the French government worked with FDA to develop a program through which France now inspects and certifies plants making soft-ripened and goat cheeses to ensure that exports are made under sanitary conditions. The occurrence of *Listeria* in French products covered by this program has dropped dramatically. Meanwhile, FDA continues monitoring imported soft cheese.

FDA has also surveyed domestic and imported hard cheeses, such as Parmesan, Romano and Cheddar. It found only one domestic lot, a Cheddar, and one imported lot, a Romano from goat's milk, that contained *Listeria*, and both were destroyed before reaching consumers.

As a sequel to its dairy initiatives, FDA looked into potential microbial hazards in seafood products. FDA has found *Listeria* in three types of imported seafood: frozen, cooked crab meat; cooked shrimp; and cooked surimi (an imitation shellfish product). FDA prevented these products from reaching the market and now is stepping up its domestic and import safety assurance programs for cooked seafood products.

Elsewhere, segments of the food industry are confronting *Listeria* through special efforts of their own. The dairy industry is pouring enormous resources into training and educating its members about microbial safety. Industry members also have opened their plants and facilities to FDA so the agency can conduct product safety training courses for its own employees and members of state regulatory agencies. And various dairy groups are investing over $1 million in scientific research on *Listeria*.

At the international level, numerous cooperative efforts are under way to tackle the risks of listeriosis. Many nations are joining the United States in sharing information and research results. Earlier this year, the listeriosis working group of the World Health Organization issued recommendations to public health authorities on preventing listeriosis in humans.

Listeria Research

Despite these activities, many questions about *Listeria* remain. One is the extent of listeriosis in the United States. Until 1986, no systematic monitoring existed for this disease. Now, however, the Council of State and Territorial Epidemiologists has recommended to its members that listeriosis be a "reportable" disease, meaning doctors would be expected to report it to state health officials. Additionally, FDA and CDC have undertaken a special project to detect all listeriosis cases within a study area of 34 million individuals. From this study, CDC has estimated there are approximately 1,600 cases of listeriosis in the United States each year.

Scientists also are focusing on factors that lead to listeriosis in humans. Douglas Archer, Ph.D., director of the microbiology division in FDA's Center for Food Safety and Applied Nutrition, explains that understanding the disease mechanisms of *Listeria* is difficult because, "You've got two moving targets. You've got the virulence [the degree of infectiousness and the severity of the resulting illness] of the organism itself, which is a function of its genes. We don't really pretend that we understand all those factors. The other moving target is the susceptibility of the human. Some people may be exquisitely sensitive and others less so."

Discovering the answers to these unknowns is critical to effectively controlling the risks posed by *Listeria* as well as other microorganisms. For this reason, several laboratories, including some at FDA, are studying how *Listeria* makes us sick and why some people are more predisposed to its effects than others. One discovery in this area has been that *Listeria* contains a gene that instructs the microbe to produce a protein similar to the cholera toxin, which causes inflammation in the stomach and intestine.

To prevent the hazards of *Listeria*, it's also important to have a quick, sensitive and reliable method for finding it in food. In the past, this has been a major problem, because tests could take up to two months before giving results. Now, some of the early fruits of biotechnology are providing solutions to this dilemma. New tools called "DNA probes" can be designed to zero in on special characteristics of a microorganism's genes, and thus signal if a particular microbe is present in food. Such probes now exist for *Listeria*. One detects all *Listeria* species, and another - developed by FDA - is specific for *Listeria monocytogenes* and reduces the time for its detection to two days. FDA already has used this probe to measure *Listeria monocytogenes* in food samples and now is field-testing it by comparing it with conventional methods.

In additional research, FDA has studied pasteurization procedures. Based on the results of this work, as well as investigations in other countries, the WHO working group determined that current procedures are adequate for controlling *Listeria monocytogenes* in pasteurized milk and products made from pasteurized milk.

Because unpasteurized milk can be a source of infectious diseases, including listeriosis, it's especially important that pregnant women and other high-risk individuals avoid consuming it.

Karen Skinner is a special assistant to the commissioner of FDA.

Reported from July-August 1988/ FDA Consumer.

Protective Products For Controlling Corrosion of Municipal Wastewater Treatment and Collection Facilities Described in Sauereisen Literature

Literature addressing corrosion of municipal wastewater treatment and collection facilities has been published by Sauereisen Cements Company, Pittsburgh, and is available upon request.

The literature, titled "Concrete Protection for Municipal Wastewater Treatment Facilities," discusses the corrosion problems associated with municipal wastewater treatment and collection systems, and describes protective products available from Sauereisen.

In industrial systems, corrosion commonly occurs below the water line due to direct agression of chemicals present in various discharge streams. In contrast, corrosion in municipal wastewater treatment and collection systems is encountered above the water line and is typically microbiologically induced.

The literature focuses on the factors contributing to the corrosion process and explains how concrete protection systems extend the life of municipal systems. By utilizing the various corrosion-resistant products featured in the literature, infrastructures may be spared the expensive and pervasive problems caused by microbiologically induced corrosion.

Whether a preventative coating is required for new structures, repair material is needed for slightly corroded surfaces, or there is a need to rehabilitate severely corroded areas, Sauereisen Cements Company is offering effective, economical products and systems.

To receive a copy of this literature, write or call: Sauereisen Cements Company, 160 Gamma Drive, RIDC Industrial Park, Pittsburgh, PA 15238 412/963-0303.

Beer Technology May Aid In Industrial Water Treatment

Industrial water treatment may benefit from technology developed for beer processing. J.E. Siebel Sons' Company, a Chicago-based brewing industry consulting and supply firm, has successfully employed a special blend of marine plant gums (seaweed) for product clarification during the brewing process.

According to Dr. David S. Ryder, Siebel's vice president for technical services, the two basic seaplant gums function to precipitate protein materials and provide binding action to allow easier removal of the precipitate. Siebel's "Breakbrite" product, containing these seaplant gums, is now used extensively by brewers to remove colloidal materials. This enhances the colloidal stability of beer and aids in its effective filtration.

FMC Corporation's Marine Colloids Division predicts that the meat, poultry, fish and dairy industries will be the first to experiment with this technology to remove and economically recover proteinaceous materials from process water. There is a growing market for extracted proteins in supplementing food and cosmetic products.

FMC Corporation's Marine Colloids Division, the world leader in research and production of carrageenan, produces over 100 seaweed based products. Selection of the proper type or blend of types will be based on the specific material to be removed from the water.

Additional information may be obtained by contacting FMC Corporation, Marine Colloids Applications Department, 2000 Market Street, Philadelphia, PA 19103.

Milk Supplies Safe - Consumer Protection Goal of Aflatoxin Testing Programs

Consumers can feel confident that milk supplies in the food chain are totally safe from any problems of aflatoxin as a result of tests conducted to assure food safety.

Dr. Al Wagner, a food technologist with the Texas Agricultural Extension Service, said that monitoring and testing programs for milk supplies are designed to produce quality food products.

"Milk--or other foods--that do not meet tough standards are automatically withdrawn from the market," Wagner said.

Another expert in the area of dairy food safety, Kirmon Smith of Austin, director of the division of dairy products with the Texas Department of Health, said consumers can have great confidence in the safety of the milk supply.

"We have strict screening programs under way that sample and test tankerloads of milk coming into Texas, as well as testing programs for individual dairy farms in the state. Any milk that does not meet our strict standards is immediately withdrawn and does not get into the food chain," Smith said.

Smith said that through the testing program, milk containing aflatoxin levels above the maximum allowed (.5 parts per billion) has been traced to 1.3 percent of the dairy farms in Texas, or about 30 Texas dairies this month.

"These milk supplies were discarded immediately, so consumers should have no concerns about these

dairy products. Furthermore, our testing program is continuing to assure that future supplies also are safe," Smith said.

Wagner said that the widespread drought in Texas, the Mid-West and other grain-producing areas of the nation has created possible toxic problems with feed. Aflatoxin, a type of mycotoxin produced by fungi, can be toxic to livestock fed the contaminated grain.

Whether grain is contaminated with mycotoxins can be determined by a blacklight test, but a more sophisticated test is needed to determine the actual aflatoxin levels. Feed samples can be sent to the Texas Veterinary Medical Diagnostic Laboratory at Texas A&M University, or to commercial companies, for testing.

For more information contact Dr. Al Wagner, 409/845-7341.

INFO 89 - "Service: Your Survival Kit for the '90s"

New techniques, trends, tactics and strategies are on the agenda at INFO 89, the only national conference designed exclusively for independent foodservice operators. In 1989, the focus is on "Service: Your Survival Kit for the '90s." Sponsored by The Educational Foundation of the National Restaurant Association, it will be held March 9-11 at the Monterey Sheraton, Monterey, CA.

Opening just prior to the Monterey Wine Festival, sponsored by the National Restaurant Association, to be held March 12-15, INFO 89's expert industry speakers will discuss how service will be the key to success in the years to come. Some topics to be covered are:

* How to Market Service
* How to Hire Service
* How to Train for Service
* How to Menu/Merchandise Service
* How to Pay for Service

Also featured will be:

* Washington Update: The New Administration and Your Operation
* The Consumer of the '90s: What Your Customer Will Demand

For further information, or to register for INFO 89, contact The Educational Foundation of the National Restaurant Association, Customer Service Department, 250 South Wacker Drive, Chicago, IL 60606 or call 312/782-1703 or 800/522-7578.

HunterLab Opens Midwest Office

Hunter Associates Laboratory, Inc., the leader in color and appearance measurement instrumentation, is pleased to announce the opening of a new sales and service center in Naperville, Illinois. This satellite office will be a full-service facility, encompassing customer service personnel and a sales showroom with on-line and laboratory demonstration equipment.

The establishment of this center provides a link between midwestern industry and the HunterLab corporate offices in Reston, Virginia, increasing our ability to support the Midwest. The new facility is located at: 426 W. 5th Avenue, Naperville, Illinois 60540 312/420-1020, FAX: 312/420-1770.

Waukesha Pumps Promotes Mazza To Director of Sales and Marketing

Waukesha Pumps, AMCA International, of Waukesha, WI, announces the appointment of Anthony "Tony" Mazza to the position of Director of Sales and Marketing. According to James S. Dahlke, VP and General Manager, Mazza's responsibilities will include marketing the firm's lines of sanitary and industrial pumps through domestic regional sales offices and a network of stocking distributors. Waukesha's major markets include food processing, dairy, chemical, wastewater treatment, beverage and pharmaceutical.

Since joining the Waukesha Pump sales organization in 1976, Mazza has served as Eastern Regional Sales Manager. He received a BA degree in economics from Rutgers College and an MBA degree in marketing from Fairleigh-Dickinson University.

For further information contact Waukesha Pump, AMCA International, 1250 Lincoln Ave., Waukesha, WI 53186 or call 414/548-5800.

3-A Sanitary Standards Committee Approves 3-A Documents

The 3-A Sanitary Standards Committee have officially approved seven 3-A documents during their regular meeting in Milwaukee, Wisconsin. They are:

(1)Revised 3-A Accepted Practices for permanently Installed Product and Solution Pipelines and Cleaning Systems Used in Milk and Milk Products Processing Plants, Number 605-03. Effective November 1, 1989.

(2)Revised 3-A Sanitary Standards for Liquid Pressure and Level Sensing Devices, Number 37-01. Effective November 1, 1989.

(3)Revised 3-A Sanitary Standards for Stainless Steel Automotive Milk and Milk Products Transportation Tanks for Bulk Delivery and/or Farm Pick-Up Service, Number 05-14. Effective November 1, 1989.

(4)New 3-A Sanitary Standards for Fittings Used on Milk and Milk Products Equipment and Used on Sanitary Lines Conducting Milk and Milk Products, Number 08-17H (Thermoplastic Plug Type Valves). Effective November 1, 1989.

(5)Amendments to 3-A Sanitary Standards for Multiple-use Plastic Materials Used as Product

Contact Surfaces for Dairy Equipment, Number 20-15. This amendment provides for polyethylene Phthalate Polymers and is effective March 1, 1989.
(6) (7) Amendments to 3-A Sanitary Standards for Non-Coil Type Batch Pasteurizers, Number 24-02 and Non-Coil Type Batch Processors, Number 25-02. Both effective November 1, 1989.

These 3-A documents will be published in the June and July, 1989 issues of *Dairy, Food and Environmental Sanitation* except for Number 20-15 which is in this issue. After the effective dates for the equipment standards only, fabricators may apply to the 3-A Symbol Council for authorization to display the protected 3-A Symbol on equipment complying with the new, revised and amended standards.

Pre-print copies of these new 3-A documents will be available from the 3-A Secretary, DFISA, 6245 Executive Blvd, Rockville, MD 20852-3938.

Brink Named UDIA CEO as Peterson Retires

M.F. Brink, Ph.D., today was named chief executive officer of the United Dairy Industry Association (UDIA). The Executive Committee of the UDIA Board of Directors made the appointment upon the resignation of Edward A. Peterson, who is retiring.

A 26-year veteran of the dairy industry, Brink has served in the position of UDIA executive vice president, Operations, since September 1985.

"UDIA will continue to pursue the goals set by the recent Strategic Action Committee," Brink commented. "This means we will build on the federation concept to utilize the combined talents and strengths of member organizations, affiliated Dairy Council units, our board and UDIA staff to formulate the most effective grass roots dairy promotion programs."

Peterson has served as UDIA chief executive officer since September 1985. Previously, he was UDIA's executive vice president of Operations. He came to UDIA in 1981 from his position as executive secretary of Milk Promotion Services, Inc., the New England dairy promotion unit.

Brink brings a record of service to his new position. In his most recent position as executive vice president, his duties included administration, coordination and management of all UDIA promotion program plans and budgets, liaison between UDIA and its member organizations and affiliated Dairy Council units and between UDIA and National Dairy Promotion and Research Board, management of Dairy Center building operations, and supervision of all UDIA senior staff.

He served as president of NDC, the nutrition research and education arm of UDIA, from 1971-1985. His responsibilities included development of long-range Dairy Council program plans, administration of policies, programs and business of the Council and other administrative functions.

Brink joined NDC in 1962 as associate director of Nutrition Research. He was named Nutrition Research division director in 1965 and acting president of NDC in 1970.

Brink received a Ph.D. in Nutrition and Biochemistry from the University of Missouri, Columbia, and B.S. and M.S. degrees from the University of Illinois, Champaign-Urbana.

A resident of Wilmette, Illinois, Brink was born and raised in Golden Eagle, Illinois, a farming community located in the far southwestern part of the state.

UDIA is a member-driven federation which coordinates a total promotion program to increase sales of U.S.-produced milk and other real dairy foods.

New Wall Chart Listing Antimicrobial Agents

Becton Dickinson Microbiology Systems, Cockeysville, MD announces a new updated wall chart listing antimicrobial agents available in the United States or abroad. The chart, printed in a rich two-color combination of black and russet, identifies antimicrobial agents available as Sensi-Disc® susceptibility test discs, listing their trade name, manufacturer, derivation, catalog number and code.

Sensi-Disc susceptibility test discs currently being used for investigational work are also listed on this reference chart, as are more recently released agents such as Ciprofloxacin and Ampicillin/Sulbactam.

Both laboratories performing Bauer-Kirby susceptibility tests using the BBL® Self Tamping 6, 8 and 12 place Dispensers and those performing microtiter broth-dilution susceptibility tests will benefit from this convenient laboratory reference poster.

BBL and Sensi-Disc are trademarks of Becton Dickinson and Company.

Direct editorial inquiries to: Dorothy Steltzer, P.O. Box 243, Cockeysville, MD 21030 or call 301/771-0100, ext. 2304.

18th Annual Western Food Industry Conference to be held March 28-30, 1989.

The Western Food Industry, a technical and scientific updating conference for the food industry is in its 18th year. The conference, since its beginning, has been co-sponsored by the Northern and Southern California sections of the Institute of Food Technologists, the California Dairy Industry Association, and the University of California at Davis.

The continuing theme of the conference is *Looking Ahead through Education.*

Topics are selected by a committee representing the

conference sponsors to update and further the scientific and technical expertise of western food processors. On Tuesday morning there will be a general session on *Pesticides and Herbicides, Is There a Problem?* Public perception is that pesticides and herbicides are major public health problems. Topics to be covered are: *How Safe is Safe -- a Public Policy Quandary; Toxic Chemicals, How is Toxicity Determined -- What are the Risks?; Are Pesticides a Public Health Hazard?; What are the Risks from Pesticides from a Human Health Perspective;* and *What Is the Industry Perspective?* Tuesday afternoon, there will be three concurrent sessions: *Quality Control/Statistical Process Control; Current Health Issues of Interest to the Food Processing Industry;* and *Antibiotics in Drugs and Milk.*

On Wednesday morning the three concurrent sessions are: *Microbiology of Refrigerated Foods; Ingredient Update* (continuation), and *Recent Advances in the Control and Use of Enzymes in Foods.*

Wednesday afternoon the three sessions are: *Microbiology Update* (continuation), *Computer Software Update;* and *Shelf Life of Dairy Products.*

On Thursday morning there will be a general session on *Where Are We With Proposition 65?* Topics to be included in this session are: A Perspective on Natural Toxicicants; Foods and Cancer Risks; Sound Science vs. Implementation of Regulations and Where Has Proposition 65 Taken Us Up To Now?

The conference will conclude at noon on Thursday, March 30.

There will be a wine and cheese social on Tuesday night and on Wednesday night two banquets; A California Dairy Industry Awards Banquet and Food Industry Banquet honoring IFT's 50th Anniversary.

For further information on the conference, contact Shirley Rexroat 916/752-2191 or Bob Pearl 916/752-0981, Department of Food Science and Technology, University of California, Davis, CA 95616.

News and Views from The Foodservice & Packaging Institute

Ovenable Container Test Procedures -- Copies of *Test Procedure Guidelines to Quality Dual Ovenable Containers* are now available from the Foodservice & Packaging Institute. These guidelines are the successful product of more than a year's work by FPI's Ovenable Container Division. The guidelines include such topics as: oven calibration; temperature resistance; impact resistance; odor limits; microwave oven criteria; and a glossary of terms. One executive has hailed the guidelines as, "A major contribution to manufacturers and food company users of ovenable containers."

New Environmental Publication -- "The Environment and Foodservice Disposables" is the name of a new FPI brochure that answers some of the most commonly asked questions about single service products. The brochure covers topics such as CFCs, disposables and solid waste management, and litter prevention. Copies are available on request.

Day Care and Disposables -- To better inform childcare providers of the benefits of foodservice disposables, FPI has issued a new brochure that outlines the sanitary, time-saving, educational, and convenience features of disposables in day care center operations. Copies are available on request.

For additional information or further details about any item contained herein, call or write Joseph H. Spina, Director of Member Services, Foodservice & Packaging Institute, 1025 Connecticut Avenue, N.W., Suite 513, Washington, D.C. 202/822-6420.

Catalog Features Simplified Food, Beverage and Cereal Analyses

Hach Company announces a new, 20-page catalog for food, beverage and cereal analysts. Titled *Rapid, Economical Systems for Analysis*, it supplies typical test procedures, product descriptions and ordering information. More than 20 innovative, Hach-simplified analytical tests are presented -- ranging from "Acid Detergent Fiber" to "Zinc."

Procedures requiring sample digestion feature Hach's Digesdahl^R Digestion Apparatus, a compact unit requiring less than 15 minutes to prepare a sample digest for the colorimetric measurement of both crude protein and minerals. Catalog descriptions also include an acid digest/solvent extraction method for fat analysis. It is able to provide rapid, accurate results without use of a centrifuge.

To receive a free copy of *Rapid, Economical Systems for Analysis*, contact Hach Company, PO Box 389, Loveland, CO 80539 and request literature number 4072.

Foodservice in the Year 2000: National Restaurant Association Releases Study

In the year 2000, lower calorie menu items in restaurants will be commonplace, and nutrition concerns will be critical to menu development in all types of establishments. Waitstaff will use electronic ordering units. The industry will become more international, with U.S. operators entering foreign markets and foreign operators penetrating the U.S. market. And government efforts to regulate foodservice will intensify, particularly in the areas of sanitation, food handling, waste disposal, wages and benefits.

These are just some of the many predictions contained in "Foodservice Industry 2000," a futuristic study conducted by the National Restaurant Association. The just released study outlines the subjective assessments of a panel of industry experts, including the association's board of directors, as to how foodservice will fare at the turn of the century. A total of 108 industry leaders, educators and consultants provided judgements about the industry's future in nine categories: industry structure, workforce; government; technology; facilities and operations; finance; food and menu; marketing; and external issues.

Although many of the panel's predictions are continuations of trends already underway, substantial changes in some areas of the industry are predicted. For instance, when examining external issues which affect foodservice, over eight out of ten panelists felt that clean air and water would be of significantly greater concern by 2000, thereby generating a variety of water restrictions and recycling possibilities for restaurants. Panelists also observed that the use of nonbiodegradable packaging in the industry would likely be restricted in 2000.

Regarding government issues, over one half of the panel members believed that increased government intervention would be putting some operators out of business at the turn of the century. However, the panel was optimistic that industry grassroots efforts will grow by the year 2000.

And panelists predicted the foodservice labor shortage will worsen by 2000, with no end in sight for the industry's high turnover rate. However, panelists noted that more training programs and a greater degree of specialized study will be available for foodservice workers, and productivity and service will be emphasized.

"Foodservice Industry 2000" is the latest in the National Restaurant Association's series of Current Issues Reports. It is available through the association's publications department at: 1200 Seventeenth Street, N.W., Washington, D.C.; 202/331-5900 or 800/424-5156. The cost is $3.00 plus handling for association members and $10.00 plus handling for non-members.

The Educational Foundation Consolidates its Offices in New Chicago Location

The Educational Foundation of the National Restaurant Association is consolidating its Washington, D.C. and Chicago offices into a new headquarters location in downtown Chicago.

Effective November 1, The Educational Foundation's new address is: The Educational Foundation of the National Restaurant Association, 250 S. Wacker Drive, Chicago, IL 60606 312/782-1703.

The telephone number will remain the same as in the past.

Located directly across from the world's tallest building, the Sears Tower, and overlooking the Chicago River, the new headquarters occupy the entire fourteenth floor, doubling the size of The Foundation's current office space.

Part of the new space contains a permanent Conference Center in which The Educational Foundation will hold some of its approximately 300 annual seminars, as well as conducting in-house customized seminars and other training for those with more specific needs.

Henry J. Cockerill, Chairman/President of The Educational Foundation, says, "By combining the two offices The Foundation will better coordinate its efforts to advance professionalism in the foodservice industry. With this move, we will increase both our effectiveness and cost efficiency."

The Educational Foundation of the National Restaurant Association was formed on January 1, 1987, through consolidation of the National Institute for the Foodservice Industry (NIFI) and the educational and training activities of the National Restaurant Association.

Foodservice Packaging Industry to Stop Using Harmful CFCs by Year's End

Manufacturers of foam plastic food containers will phase out the use of fully-halogenated chloroflourocarbons (CFCs), which are destructive to the Earth's ozone layer, by the end of 1988, according to a report presented at the National Restaurant Association's Fall Board Meeting.

Joseph W. Bow, president of the Foodservice and Packing Institute (FPI), told the association's directors that this voluntary phase-out program by the foodservice packaging industry is supported by leading environmental agencies, including Friends of the Earth, Environmental Defense Fund and National Resources Defense Council. The industry program provides for a significantly speedier phase-out of CFCs than called for by the United Nations, which originally proposed the CFCs be phased out over a six-year period, Bow said.

National Restaurant Association President Jim L. Peterson applauded the foodservice packaging industry's initiative in developing the phase-out program. "By voluntarily discontinuing the use of fully-halogenated CFCs from foodservice packaging, the industry has demonstrated its concern for the environment and its respect for the planet on which we all live," Peterson said. "This program sets the standards for all industries which use CFCs in their products."

According to Bow, manufacturers using fully-halogenated CFCs will substitute the compound HCFC-22,

recommended by the Environmental Protection Agency as an "excellent alternative," HCFC-22 reduces by more than 95 percent the threat to the ozone layer when compared to fully-halogenated CFCs. Bow told the association's board that the phase-out of fully-halogenated CFCs, which had been used in approximately one third of foodservice foam products, is approximately 90 percent completed with a 100 percent phase-out scheduled by December 31, 1988.

For more information please contact Anne Papa at 202/331-5938.

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Solvit Inc.'s all **Metal Rat Cafeterias** now feature slide-on covers for all three sizes of cafeterias. These covers give the operator easier access into the station. Tamper-proof baffle kits are also available for the large, junior and mini cafeterias. *Contact: Solvit Inc., 7001 Raywood Rd., Madison, Wis. 53713, (608) 222-8624.*

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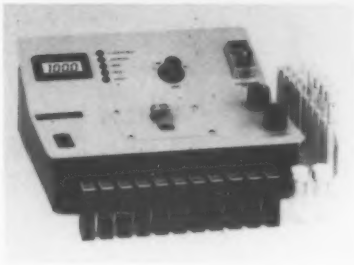

Absorbance Colorimeter - For Water and Wastewater Testing

• Orbeco-Hellige Model 980 Absorbance Colorimeter tests water, wastewater, process fluids, or anything requiring state-of-the-art photometric analysis. Direct readings of Percent Transmittance, Absorbance, or Factored Concentration are available. Cuts operator testing time by enabling repeat testing using Concentration Factor, even if other tests are performed in between.

Utilizes permanent glass wavelength filters for use with standard colorimetric procedures. Optional computer output capability. Independent Laboratory evaluations favor the 980 to many more expensive Spectrophotometers because of superior stability and repeatability.

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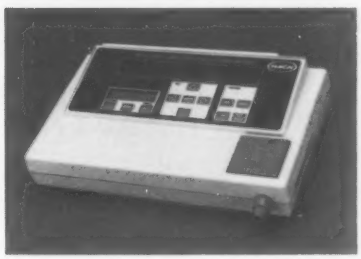

New Laboratory pH/ISE Meter Features True Non-Linear Calibration

• Hach Company introduces the new Hach One Laboratory pH/ISE Meter. This microprocessor-controlled instrument features both linear and true non-linear calibration for the most accurate results possible at all concentration levels. Up to six calibration standards can be used. If response is not linear, the meter statistically fits a high order polynomial for precise, non-linear calibration.

Ion concentration is displayed directly, eliminating the need to construct time-consuming calibration curves. Users can select from six operational modes, including: pH, concentration, mV, relative mV, incremental methods and temperature.

Standard and analate addition/subtraction provides measurement of samples with varying background and interference levels, and double standard addition permits analysis of unknown samples without prior electrode calibration.

Other features include dual, independent measurement channels; menu-selectable operation in four languages; programmable reading stability indicator; automatic buffer recognition; complete calibration reviw; RS232C input/output; programmable control outputs; adjustable recorder output; non-bolatile memory; and a sealed, corrosion-resistant keypad.

This meter is designed for use with ultrastable. Hach One electrodes. One push of the built-in reference electrolyte dispenser establishes a frewh, nearly constant reference junction potential for the fastest response and longest electrode life possible.

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MAINSAVER

• MAINSAVER is the most complete maintenance management software system available for IBM and IBM compatible personal computers, the IBM SYSTEM/36 and SYSTEM/38 minicomputers and the DEC VAX computers. Developed by J B Systems, Woodland Hills, CA, MAINSAVER is being used by industry and the public sector for maintenance of equipment, facilities, and equipment fleets.

Designed to enhance the professional role of the maintenance manager and the maintenance function, the system consists of six basic modules. Each module was created for covering specific maintenance problems in the areas of cost reduction, cost avoidance and cost control. Additionally, the system gives the maintenance manager a monthly report on the state of the maintenance function for his entire operation. This report includes statistics, graphs and costs for the maintenance department.

MAINSAVER has been successfully operating in maintenance organizations since 1983 with systems in national and international locations. As a pioneer in the use of microcomputer based systems, J B Systems brings a unique blend of expertise to the field of automated maintenance systems. Members of the staff have been directly involved in developing and servicing computer-aided maintenance systems since 1977.

J B Systems, Inc. was founded in January 1983, for the purpose of providing computerized maintenance management software that operates on both micro and minicomputers. The company offers a full line of preventive maintenance, inventory and purchase order control software with continuing support services to the manufacturing, transportation, utilities and process control industries. Several of their software packages have been customized to meet the needs of special market segments, such as hospitals, school districts, water treatment plants and companies in the food processing, automotive and petroleum industries. J B Systems, Inc. is a private company with headquarters located in Woodland Hills, California.

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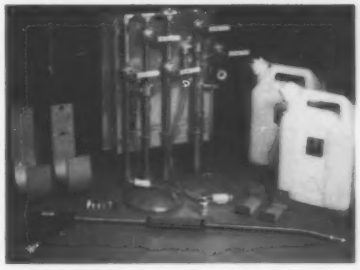

Dual-Pressure Cleaning Station Introduced by Chemidyne

• From Chemidyne Corporation comes "Commander Quad," a rinse/foam/sanitizing station that allows use of high and low water pressure from the same system. The unit feeds water for cleaning, foaming and rinsing at 600 psi, 3-4 gpm; for large-area cleaning at 250 psi, 8 gpm. It forces the use of the proper nozzle and monitors the sanitizer supply; the sanitizing drop meters the proper mix for flood sanitizing. For use with the Commander I systems.

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"Safe-Pak" - The Recommended Way to Transport or Mail Lab Specimens, Slants or Cultures

• Med-Pak Division of Self-Seal Container Corporation has developed an approved mailing container system for the transport of Etiologic Agents and Biohazardous Lab Specimens under the brand name "Safe-Pak".

"Safe-Pak" Dual Specimen Transport Mailing Containers are the ideal combination of leakproof seamless aluminum screw-cap container and fiberboard screw-cap mailing case where a dual type unit is required by Postal Regulation for the mailing of "Etiologic Agents" or "Biohazard Specimens". They are recommended for use in the shipment of slants and cultures in the food and dairy industries, pharmaceutical reagents and test samples, or any toxic industrial laboratory specimen. Clinically, they are approved by the CDC for mailing blood samples when testing for AIDS, TB, Hepatitis or other infectious diseases.

Each aluminum container is autoclavable and the cap is lined to prevent leakage. "Safe-Pak" Dual Specimen Transport Mailing Containers conform with U.S. Postal Regulations (42 CFR, Par 72.25) for Etiologic Agents when appropriate labeling (50/pack included with each case) and absorbent packing materials are utilized. They also conform with the International Air Transport Association (IATA) guidelines for overseas shipments. Enforcement of these guidelines by the Postal Service and Private Couriers is becoming more apparent. Nine of the most comon sizes are offered in case quantity sets of 24 or 50.

Also featured are the "Safe-Pak" Single Fiberboard Mailing Cases which provide protection for all sorts of laboratory glassware, bottles, reagents or non-toxic chemicals. They are constructed of heavy-duty fiberboard with crimped metals rims and seamed metal bottoms. The threaded rims and metal caps insure an easy, yet secure closure. Eight sizes, in small case quantities, are offered to facilitate the smaller end-user.

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Chemdet Introduces New Sanitary S-Turbodisc for Total Internal Tank Cleaning

• The new sanitary S-Turbodisc from Chemdet, Inc. produces superior CIP (clean-in-place) tank cleaning results at low pressures and with low flows. Designed for CIP tank cleaning applications in the food, dairy, beverage, cosmetic, pharmaceutical and similar industries, the Sanitary Turbodisc conforms to applicable FDA, USDA and 3A standards for materials in contact iwth foods, pharmaceuticals and dairy products.

Self-operated by the cleaning fluid, the S-Turbodisc provides a vigorous, dense spray to thoroughly clean tank interiors. The uniquely designed curved disc provides a spray pattern so comprehensive, it cleans all surfaces on the inlet tube and above the cleaning head.

Made of stainless steel and approved plastic, the S-Turbodisc has only four parts which are held together with a simple clip. This special design makes the inspection or cleaning of individual parts quick and easy. And with only one moving part, little or no maintenance is required. There are no small holes to block and the minimum orifice size is 1/8 in. (3.175 mm). No oil or grease lubrication is used. The cleaning fluid is the only lubrication necessary.

The continuous all-around spray pattern created by the unique rotating disc design provides maximum surface coverage with a minimum flow saving time, energy, and water. The reliable, economical, low-maintenance sanitary S-Turbodisc is ideal for a wide range of industries where the batching, processing, transportation or storage of products requires frequent and thorough cleaning of tank or container interiors.

The S-Turbodisc Model 100-S operates at pressures from 20 to 60 PSI, has a 2.44 inch disc diameter and a cleaning radius of 7 to 10 feet.

The S-Turbodisc Model 150-S operates at pressures from 20 to 60 PSI, has a 3.14 inch disc diameter and a cleaning radius of 10 to 13 feet.

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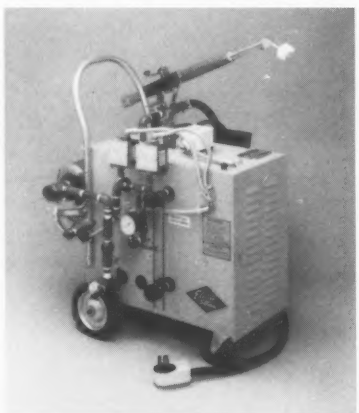

Sensall Introduces an Automatic Self-Testing Switch for Liquid Level Control

• The model 503PD operates with a wide variety of ultrasonic level sensors to provide reliable local switching contacts for level control. When used with the appropriate sensor, this recent innovation allows the 503PD to automatically test the sensor, electronics and wiring. Every ten seconds an electronic signal artificially stimulates the sensor to simulate an alarm condition; if a fault is sensed, a malfunction relay is actuated.

The 503PD switch offers field-selectable failsafe, which allows the user to choose high or low level switching applications.

The amplifier/switch enclosure is NEMA 4 watertight and NEMA 7 explosion proof, and is rated for all weather conditions in temperatures from -22° to +158°F. Model 503PD operates on 115 VAC, models using 24VDC and 220 VAC are also available.

Like all ultrasonic level controls, the 503PD features no moving parts, is maintenance free, and operates in a wide range of problem liquids.

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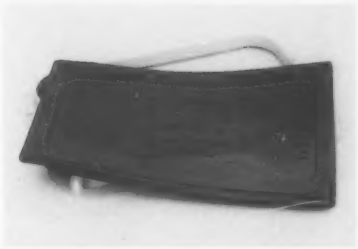
Put Away the Boots and Mops

• By using an Electro-Steam generator to clean tanks, equipment, lines, walls and floors you can save hours of mopping water. Tough on grease, the generator sanitizes and combats listeria, using only 4 to 6 gallons of water per hour.

Manufactured for 36 years by the Electro-Steam Generator Corp. using ASME, UL and CSA standards of approval.

Please circle No. 253
on your Reader Service Card



Flexible rubber CYA® Access/Inspection Doors from Martin Engineering Company a dust-tight seal with simple, no-tool operation to allow easy access to process equipment and conveyor systems.

CYA Doors from Martin Engineering Offer Dust-Tight Convenience

• CYA Access/Inspection Doors from Martin Engineering Company offer convenient access to process equipment without the hassles of fasteners and hinges.

Originally developed to allow efficient service of conveyor belt cleaners, CYA Access/Inspection Doors simplify operations by providing easy access to all types of process equipment and conveying systems for inspection, routine maintenance, and troubleshooting.

Manufactured of flexible rubber, CYA Access/Inspection Doors from Martin Engineering Company combine a dust-tight seal with easy, no-tool operation. The cover's innovative design snaps over the door frame, providing a secure seal without requiring hinges, latches or fasteners which can corrode to complicate maintenance operations.

Because CYA Doors require only 2-1/2 inches clearance for removal, they can be used behind obstructions where no hinged door can operate.

CYA Access Doors are available in four sizes, ranging from 9 x 12 inches to 24 x 24 inches. A four-inch diameter POKE HOLE CYA Door is also available.

To meet the requirements of different applications, doors are available in five materials, including high temperature, fire retardant, and food grade rubber compounds. A metal frame is standard, with a durable plastic frame available for applications in food processing or corrosive atmospheres. Also available are Pressure Vacuum CYA Doors, suitable for applications where operating conditions produce positive or negative pressure.

CYA Access/Inspection Doors, like all MARTIN Products, are covered by Martin Engineering Company's Absolutely Positively No Excuses Guarantee.

Martin Engineering Company is the world leader in solving problems in the handling of bulk solids.

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on your Reader Service Card

Vangard International Introduces QUADLOOP

• Vangard has introduced a NEW disposable inoculating device that features a unique loop/sphere combination that allows either sampling fixed volumes or dilution streaking to obtain isolated colonies. On one end of the device there is a 10ul inoculating loop, lul inoculating loop or a needle. On the other end of very QUADLOOP or needle there is a unique sphere. Both ends are separated by a square handle which can be turned in 90° increments to expose 4 sterile sphere surfaces.

The Quadloop is safe, accurate, convenient, time saving and economical. The product is supplied sterile and in efficient packaging that allows the bag to be opened from either end depending on the users need for a loop (colony counting) or the sphere for dilution streaking. The Quad-needle facilitates picking up individual colonies from a crowded plate or stabbing agar test tubes.

Thousands of tests by microbiologists worldwide have helped produce an accurate, smooth, flexible loop suitable for both trainee or expert microbiologist.

Please circle No. 255
oon your Reader Service Card

New Air Curtains From Cool Curtain Provide Effective Environmental Control

• The new Cool Curtain Air Curtains will help you meet local health and sanitation requirements, reduce heating and cooling cost and make passage easier and faster. They generate a controlled screen of air across door openings to create an air seal. This seal effectively divides environments while permitting unobstructed passage. They keep heated or cooled air inside buildings and prevent entry of airborne dust, dirt and insects.

Cool Curtain Air Curtains feature air velocity and directional air flow controls and have either a stainless steel or enamel finish. Cool Curtain Air Curtains are an effective environmental control in the open doorways of restaurants, supermarkets, industrial plants, food processing plants, shopping plazas, hospitals, nursing homes, laboratories, schools and clean rooms.

Please circle No. 256
on your Reader Service Card

Replace Corrosion With Fiberglass Ceiling System

• The leading manufacturer of fiberglass materials has added a non-corroding, maintenance-free, suspended ceiling grid system to its product line.

Kemlite Sanigrid , new from Kemlite Company, is a ceiling grid system made of fiberglass reinforced plastic (polyester). Its smooth surface will not rust or corrode. The pultruded grid sections snap together with unique, double-duty clips for easy assembly and installation.

This lightweight frp grid system has been tested successfully in the U.S. and Canada for several years. It has outperformed metal in all kinds of food processing applications, especially dairy and cheese plants where lactic acid in the atmosphere erodes metal building materials. It is also unaffected by moisture and humidity, making it ideal for cold storage rooms, bakeries, kitchens and cafeterias.

Sanigrid accommodates ceiling panels from 1/16" to 2" thick. It is ideal for both retrofit and new construction.

Kemlite Glasbord frp panels used in the grid system provide a total ceiling surface that will not pit, peel, retain odors or support mold. Glasbord panels also reflect light, creating a bright work area for employees.

Sanigrid and Glasbord panels are available at more than 65 stocking locations nationwide.

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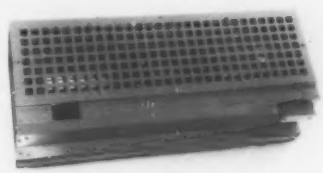

Industry Comes Clean With Drew Polymers

• In addition to process polymers that can improve production and product quality, Drew supplies a patented line of coagulant, flocculant, and defoaming polymers that help industry meet plant, state, and federal clean water standards for water use and discharge.

Correct and timely polymer application enables the economical recovery of raw materials from process and waste water, and demonstrates corporate civic-mindedness. By addressing community concerns about the safety and aesthetics of effluents discharged into local waterways, industries can secure their reputations as good neighbors.

Liquid organic coagulants, such as Drew's AMERFLOC and DREWFLOC , come in a variety of chemistries and molecular weights, to produce a higher rate of reduction in sludge volume than is possible using inorganic liquids specifically designed for heavy-duty applications, such as oily waste demulsification.

In the wastewater stream, noncorrosive polymers are combined with organics to condition sludge and eliminate scale with the process and boiler systems. Drew flocculants include liquid dispersants, low-dust powders, and liquid solutions suited for wastewater clarification and sludge dewatering.

Today, industry-specific polymers are used for such wide-ranging applications as food processing, chemical refining, and paper making. As just one example, paper mills can select Drew antifoams, antiscalants, clarifiers, and control agents to facilitate every step of the production process.

By integrating these products with field service, laboratory support, and monitoring equipment, Drew provides a comprehensive treatment program that is customized to each plant's specific needs.

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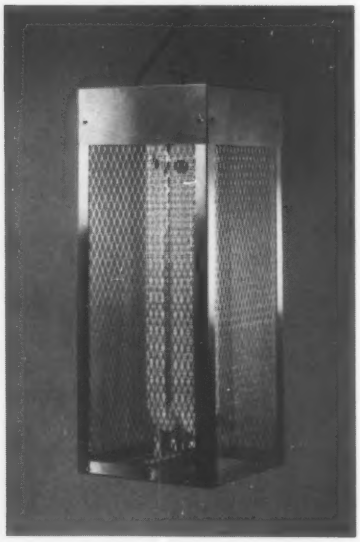

SURVIVOR 2006HE - Hostile Environment Digital Weight Indicator

• The SURVIVOR UMC 2006HE indicator from Rice Lake Weighing Systems was designed for applications in harsh, corrosive environments, making it an ideal indicator for use in fertilizer, chemical, asphalt, and concrete plants. The indicator is fully gasketed: all switches are encapsulated to protect the enclosed circuitry from harmful, external elements. Standard features include NEMA 4X wall mount enclosure of fiberglass reinforced polyester and 0.8" high LED display digits. To enhance the capabilities of the 2006HE there are many options available including setpoints, serial communication ports, and custom batching programs.

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Bugs Burger Bug Killers, Inc. Eliminates Pesticide Odors as Well as Pests!

• "Bugs" Burger the industry's leader in 100% guaranteed pest elimination announces the introduction of its new PF2000 system.

The PF2000 system allows "Bugs" Burger to perform its Premium Pest Elimination Service without the pesticide odor.

The PF2000 system eliminates pests and leaves your premises with a light talc fragrance.

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Announcing the Smokeeter Advantage

• The newly released "Go Undercover with SMOKEETER Models FS and LS" brochure reveals an effective solution to air quality problems.

Both SMOKEETER Models FS and LS are totally concealed electronic air cleaners that draw in harmful pollutants such as tobacco smoke, dust, bacteria -- particles that are too small to be seen.

The concealed systems are the most effective air cleaners due to the fact that the inlet and outlet grilles can be placed virtually anywhere in the room to create the best airflow pattern. Because they are mounted above the ceiling, these units operate more quietly than any other large capacity air cleaner. The appearance is extremely pleasing as only the inlet and outlet grilles are visible. The Models FS and LS are backed by a three year warranty to assure years of worry-free operation.

The versatility of SMOKEETERs FS and LS allows them to efficiently clean the air in various situations -- offices, restaurants, bars, bowling alleys, lounges, health care facilities, etc.

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Maintains Daily Flux Performance

• Membrane System Specialists has announced the development of a system for maintaining daily flux performance. Combining automation and propriatory **REVERTA-FLO** technology, ultrafiltration systems can be preset to a given level of performance. Thus, maintaining that level throughout most processing days.

According to the company, most ultrafiltration systems start fast and lose capacity by as much as 25% during a normal processing day. Historically, an operator must tolerate slow-down or invest large sums for additional stages and membranes to be used as production rates decline to a predetermined level.

Company officials point to reduced attention, improved cleaning ability, reduced storage capacity, streamlined operations, and improved product quality as benefits derived from their technology. Flux performance features and **REVERTA-FLO** technology are available on all new systems offered by the company and are adaptable to most brands of existing systems.

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Food and Environmental Hazards To Health

Botulism in Canada - Summary for 1987

Three botulism outbreaks, involving a total of 12 cases with 1 death, were recorded in 1987. Incident 1, a restaurant-associated type A outbreak that occurred in Vancouver, British Columbia, was caused by underprocessed chanterelle mushrooms. The mushrooms had been preserved in-house and were served only in the implicated restaurant. In addition to the 6 confirmed cases, there were 3 suspected cases reported. As a result of this outbreak, the following statement has been added to the upcoming edition of *The Sanitation Code* of the Canadian Restaurant and Food Services Association: "No in-house (non-commercial) canned or bottled foods may be served in restaurants".

The other 2 outbreaks, both type E and involving seal meat, occurred at Fort Chimo, Quebec, an area which has been experiencing the highest incidence of botulism in Canada. Since 1971, 26 outbreaks of type E, involving a total of 48 cases with 9 deaths, have been confirmed in and around this area. The incriminated food in 19 of these 26 outbreaks was seal meat.

No cases of infant botulism were reported in 1987.

Can. Dis. Weekly Report 3/12/88

Salmonella Infantis in a Hospital Obstetrical Department - Ontario

An infant, born on 17 November 1987 at a hospital in Brant County, became ill 24 hours after a routine delivery. The mother had had diarrhea associated with fever, 48 hours prior to admission to hospital. This had been clinically diagnosed as a viral infection. On 20 November, a urine culture from the infant grew *Salmonella infantis*.

Because of major renovations on the obstetrical unit, most newborns were being kept with their mothers. For those requiring constant care there was a small nursing unit in use. The index infant, a set of twins and another baby occupied this constant care nursery (CCN). On the day that the index case was found to be positive for *S. infantis*, the other single baby, apparently healthy, was discharged. The twins were moved with their mother to a private room and isolation techniques instituted. The nursery was thoroughly cleaned and cohort nursing procedures introduced.

A list was prepared of all infants, mothers and discharged patients who had been in contact with either the index baby or mother. All local physicians whose patients had been in contact with the index case or the mother were contacted and neighboring health units were informed of the contacts residing in their area for follow-up by their staff.

On 21 and 22 November, both the index baby and mother had positive stool cultures for *S. infantis*. They were treated with antibiotics and discharged from hospital on 23 November. All of the contacts appeared to be well. However, that night one of the twins became febrile, had frequent loose stools and was moved into isolation in the CCN. The twin was later confirmed to be positive for *S. infantis*. A stool culture on the third baby who had been in the CCN with the Index case and later discharged was also found to be positive for *S. infantis*. This infant was readmitted to hospital briefly and discharged on oral antibiotics because there were no signs or symptoms of illness. Cultures on these 4 patients were the only ones found to be positive for the organism out of 41 done on staff and patients in the hospital.

The index family reported eating turkey stew prior to the mother's admission to the hospital. A sample of leftover stew which was sent to the hospital laboratory for anlaysis was found to be positive for *S. infantis*. However, samples of the turkey meat used to make the stew were negative for the organism. All strains were confirmed to be *S. infantis* phage type 4.

Contact tracing carried out by the health units and family physicians showed that only the father of the index case was positive. This family was still positive for *S. infantis* as of 20 December. Both contact infants from the CCN remained positive but had no further symptoms, and the second twin was found to be positive on 30 December.

Excellent communication between the hospital infection control nurses and the health unit was influential in preventing this from becoming a major outbreak. The hospital acted by isolating the case and contacts and instituting cohort nursing and re-emphasizing the importance of handwashing.

Can. Dis. Weekly Report 3/12/88

PCB's in Old Submersible Well Pumps

Several years ago, the State Department of Health issued a warning regarding some submersible well pumps with capacitors which contain PCBs in the cooling oil. There had been several instances where such pumps failed and caused PCB contamination of the water supply.

Recently, a New York dairy farm water supply was found to be contaminated with PCBs, which was traced to a burned out submerged pump which had been replaced.

PCBs were widely used in electrical transformers and capacitors prior to 1979. They are very stable compounds and will accumulate in tissue for long periods before breakdown. PCB exposure can cause a variety of health problems from ingestion or skin exposure and are known to cause cancer and birth defects in laboratory animals.

Submerged well pumps which may contain PCB in capacitors may be identified in the following ways:
1. Pumps would have been manufactured between 1960 to 1978, probably between 1971 to 1978.
2. Pumps are oil cooled rather than water cooled.
3. Pumps involved would have a two-wire lead rather than three-wire lead. Pumps using 220 volts service would not be involved.

Failure of an oil cooled capacitor would produce a petroleum like taste and odor in the water and may cause an oil film on the water surface of stock watering tanks or toilets. A detergent flushing procedure is available which can help to remove these oil residues from water distribution systems.

Any producers who experience a petroleum taste or odor in a drilled well water supply and has a submersible pump and meets the three criteria described above should contact the local health department for assistance. The local Health Department can have a water sample tested for PCB and can advise the owner about the detergent flushing procedure.

If anyone has any difficulty in making these contacts, please contact Mr. Robert Ryan, NYS Dept. of Agriculture and Markets, Capital Plaza, 1 Winners Circle, Albany, NY 12235 - (518) 457-3513.

NYSMFS Newsletter March 1988.

Fish Delicacy Causes Botulism Illnesses and Death

It so happened last November that partaking of what some consider to be a delicacy resulted in illness in one country and illness and death in another. Before the cases were resolved, government agencies at the federal, state and local levels, as well as a foreign ministry of health and an American embassy were involved. And by the time it was over, U.S. agencies were moving to remove the product from the market completely.

The delicacy was kapchunka, a salt-cured, air-dried whitefish that is processed and sold uneviscerated (with the guts left inside the fish). Sold also under the name ribeyza, rostov and rybetz, the fish - particularly the guts - may harbor *Clostridium botulinum* bacteria spores, which produce the toxin (botulin) that causes botulism, a potentially fatal food poisoning.

On November 2, the U.S. Centers for Disease Control notified FDA's Division of Emergency and Epidemiological Operations (DEEO) that a man and his 9-year-old son were admitted to a hospital the previous evening with symptoms of botulism, including abdominal pain, vomiting, diarrhea, and blurred vision. They had reportedly eaten a salted whitefish purchased at a store in Forest Hills, N.Y. FDA's New York district office, in cooperation with New York City and state officials, immediately started an investigation, and by the next day, the fish suspected of causing the illnesses was identified as kapchunka. Working together, the officials got all the kapchunka off the market within two days.

When the initial report came in, FDA had immediately collected samples from the store where the fish was purchased and sent them to FDA's New York Regional Laboratory for analysis. That same evening, the New York City Department of Health seized all fish products (approximately 75 pounds) at the store. FDA was unable to obtain samples of the fish eaten by the father and son because the remaining scraps had been discarded. However, a stool sample from the father later tested positive for the botulin toxin.

The international aspect of the case became apparent on Nov. 3, when the FDA and CDC were notified of botulism poisoning in six people in Israel who had eaten a fish referred to as "rybetz" (later identified as kapchunka). One of them, a 77-year-old women, died 36 hours after eating the fish. Others who ate the fish became ill but recovered. Visitors to the United States from Israel had purchased the fish in Brooklyn and taken it back home in their flight carry-on luggage.

The Israeli Ministry of Health, the American Embassy, FDA's International Affairs Staff, and DEEO worked to bring the tainted fish sample back to the the United States for analysis. Both countries were extremely concerned about transporting the sample because it contained large amounts of the botulin toxin.

With all health precautions in place, the sample that caused the death of the 77-year-old woman was safely returned to the United States. Unexpectedly, a second sample was also brought back - this from someone who turned two fish in to authorities after hearing Israeli press reports about the botulism incident. Those fish, too, had been purchased in New York and transported to Israel, and samples from both contained the botulin toxin.

By Nov. 4, FDA and the New York State Department of Agriculture and Markets had inspected Arthur's Smoked Fish, the firm that processed the fish, and Gold Star Smoked Fish, the distributor - both located in Brooklyn. During the inspections, the state agency seized all kapchunka at the firms, totaling approximately 2,200 pounds,.

FDA's investigations had been complicated by a language barrier that hampered identification of exactly what product or products were involved in the illnesses. Interviews with more than a dozen people eventually revealed that different Russian names were being used to describe the same or similar products. Because of the confusion FDA visited all 22 stores that had received the uneviscerated fish from Gold Star Smoked Fish and collected 51 samples of several types of products.

Arthur's Smoked Fish's license had been revoked in June 1987, but reinstated in August after the firm passed a New York state inspection.

All kapchunka has been recalled from the market, and its manufacture has been stopped. The New York State Department of Agriculture and Markets has suspended Arthur's license to manufacture the product, and the state is working on new regulations for processing fish prod-

ucts. New York City is proposing a regulation to prohibit the sale, production and distribution of all uneviscerated, salt-cured, air-dried fish, including kapchunka. The FDA is preparing to publish a notice in the Federal Register stating that because there is no known method of processing this type of fish to guarantee its safety, it is a public health hazard and will be subject to regulatory action if marketed.

FDA Consumer May 1988.

Food Irradiation Labeling Extension Proposed

FDA's current labeling requirements for foods that have been treated with irradiation would be extended to April 18, 1990, under a regulation proposed Feb. 18, 1988, in the Federal Register.

A regulation adopted by FDA on April 18, 1986, requires that packaged foods approved for irradiation treatment state on the label that they have been "treated with radiation" or "treated by irradiation." In addition, the label must display a special international logo to alert consumers to irradiated foods. FDA allows certain foods to be irradiated to give them longer shelf life and protect them against insects.

Manufacturers would have been allowed to drop the wording, using just the logo after April 18 of this year had FDA not proposed the extension. The agency decided to propose extending the mandatory labeling language requirements because few companies are producing irradiated food products. "Very few consumers will have seen irradiated food with the required wording before this working requirement expires," the agency explained, thus they would not know the meaning of the logo by itself.

For more about food irradiation, see "The Growing Use of Irradiation to Preserve Food" in the July-August 1986 FDA Consumer.

FDA Consumer May 1988.

Under an interim policy issued by the Environmental Protection Agency, grape growers now must certify that their fruit does not contain detectable residues of sulfites. This policy will be in effect until the end of the 1988 or until EPA determines an acceptable tolerance for sulfites or an alternative for them. **Sulfites**, which are used to help prevent spoilage in stored grapes, can cause reactions **in allergic people** ranging from breathing difficulties and headaches to death. (FR Dec. 31).

The Environmental Protection Agency has placed **restrictions on the herbicide alachlor**, including a requirement that only those with proper certification can use the product and that warning labels indicate the product causes tumors in laboratory animals. Alachlor is used to control weeds in corn, soybeans, peanuts and other crops (FR Dec. 31).

FDA is requiring stricter **safety standards for potentially carcinogenic new veterinary drugs** proposed for use in food animals. Under the new standard, residues of the drugs in animal tissues cannot exceed levels that would cause a maximum lifetime risk of human cancer of one in a million.

FDA Consumer March 1988.

The Original

Sam Gray Gold Electrode

For quinhydrone determination of pH in cheese.

This electrode is referenced in *Standard Methods for the Examination of Dairy Products, 15th Edition.* Highly recommended for accuracy and reliability, the gold electrode/quinhydrone method is relied upon by major cheese buyers and producers for establishing definitive pH readings in cheese.

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Affiliate News

WAMFS Annual Meeting Held September 20, 1988

About twenty-five people attended the Wisconsin Association of Milk and Food Sanitarians, Inc. Business Meeting held in LaCrosse on September 20, including two representatives from the Ames office of IAMFES, Sandy Engelman and Julie Heim. President Randy Daggs called the meeting to order. The Secretary's and Treasurer's reports were approved as read. There were no Committee Reports.

Randy reported that the IAMFES billing system has been changed. Sandy Engelman explained the system will now be based on a twelve month schedule, so be sure to pay your dues before January of 1989.

Randy reported some of the information discussed at the IAMFES Annual meeting held in Tampa, Florida, in August which he attended.

Wisconsin won most of the awards at this year's International Meeting. Wisconsin was given the Shogren Award for the best affiliate for 1988. Ken Kirby won the Harold Barnum Industry Award; Paul Pace was awarded Honorary Life Membership; and Al Bowers received a Certificate of Merit. Randy thanked Jim Wickert for putting the award information together.

Rick Heinrich explains actions which would be instituted in the event of a nuclear plant accident.

Upcoming IAMFES Affiliate Meetings

1989

FEBRUARY

17, Georgia Association of Food and Environmental Sanitarians 3rd Annual Meeting, Snapfinger Woods Drive Holiday Inn, Decatur, Georgia. For more information contact Steve Petrides, GAFES Secretary, DeKalb County Board of Health, Division of Environmental Health, 3651 Market Street, Clarkston, Georgia 30021, (404) 292-1979.

MARCH

22-24, Michigan Environmental Health Association, to be held at the Holiday Inn, Holidome & Conference Center, Ann Arbor, MI. For more information, contact: Ike Volkers, MDPH, 3500 N. Logan, Lansing, MI 48909 517/335-8268.

APRIL

5-7, Missouri Milk, Food and Environmental Health Association, to be held at the Ramada Inn, 1100 Vandiver Drive, Columbia, Missouri. For more information, contact: Gregg Fast, Mo. DOH, NE District, 250 E. Patton, Macon, MO 63552, 816/385-3125.

SEPTEMBER

19-21, New York State Association of Milk and Food Sanitarians, to be held in Buffalo, New York, at the Sheraton-Buffalo Airport Hotel. For more information, contact: Paul Dersam, 27 Sullivan Rd, Alden, NY 14004, 716/937-3432.

Jack Grubb, right, presents a door prize to Steve Thomas.

Jack Grubb, Mayfield Dairy, serves as a Session Chairman..

Sid Matthews of the Federal Order Office explains procedures for standardizing the Babcock Fat Test.

David Mayfield welcomes the group to Athens and to the Mayfield Dairy Plant.

Dr. Biswal describes the advantages of partial drying by osmosis.

Tennessee Association of Milk, Water and Food Protection Workshop at Mayfield's Dairy

Midway between the annual meetings of the Association, the Tennessee group holds a workshop. This year it was held on November 2 and 3, 1988 at the Mayfield Dairy in Athens.

The workshop opened with a welcome to Athens and to the Mayfield Dairy Plant by David Mayfield. He, along with Jack Grubb and Wayne Crabtree, served as very gracious hosts during the two-day workshop. The session chairmen were David Moss, president of the group, the Jack Grubb of the Mayfield Dairy.

Topics discussed included: *Certification of Water Laboratories* by Ken Whaley of the Tennessee Department of Health and Environment; *The Georgia Import Milk Program* by Charles Murphy of the Georgia Department of Agriculture; *Tennessee's Nuclear Disaster Program* by Rick Heinrich of the Tennessee Department of Agriculture; *Udder Care - Pre-Dipping* by Gene Patterson of West Agro Chemical Corporation; *U.S.D.A. Revised Butterfat Procedures* by Sid Matthews of the Federal Milk Marketing Order Office, Nashville; *Interstate Milk Shippers Report* by John Sanford of The Tennessee Department of Agriculture; and *Intermediate Moisture Frozen Vegetables Through Osmotic Dehydration* by Dr. Rabindra Biswal of the University of Tennessee.

The meetings ended with a thorough trip through the Mayfield Dairy Plant.

Gene Patterson advocates the use of a teat dip prior to milking.

International Association of Milk, Food and Environmental Sanitarians Committees

Committee and Chairperson

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1989 IAMFES AWARDS NOMINATIONS

The International Association of Milk, Food and Environmental Sanitarians is proud of its members and their contributions.

As a member, you are entitled to nominate deserving colleagues for the IAMFES Awards.

Nomination forms need to be completed and back to the Ames office by April 1, 1989.

1. Previous award winners are not eligible for the same award. Check pages 42 and 43 in this issue for a complete listing of past award winners.

2. Present Executive Board members are not eligible for nomination.

3. Candidates must be current IAMFES members in order to be nominated.

Presentation of these awards will be during the IAMFES Annual Meeting August 13-17, 1989 at the Hyatt Regency Crown Center, Kansas City, Missouri, during the Annual Awards Banquet Wednesday evening.

SEND ALL REQUESTS AND COMPLETED MATERIALS TO:

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Questions? Call 800-525-5223, members in Iowa and outside the U.S. call 515-232-6699, 9-4 weekdays, or FAX 515-232-4736.

The following lists the awards that you may nominate a person for.

Nominate a deserving colleague for these prestigious IAMFES Awards:

- **SANITARIANS AWARD** - in recognition of outstanding service to the profession of the Sanitarian.
  $1000 award and plaque

- **EDUCATOR AWARD** - presented to an educator in recognition of outstanding service in academic contributions to the profession of the Sanitarian.
  $1000 award and plaque

- **CITATION AWARD** - for many years of devotion to the ideals and objectives of the association.
  plaque

- **HAROLD BARNUM INDUSTRY AWARD** - in recognition of outstanding service to the public, IAMFES and the profession of the Sanitarian.
  $500 award and plaque

- **HONORARY LIFE MEMBERSHIP** - for devotion to the high ideals and principles of IAMFES.
  plaque and lifetime membership with IAMFES

Past IAMFES Award Winners

EDUCATOR-INDUSTRY AWARD

1973-Walter A. Krienke
1974-Richard P. March
1975-K. G. Weckel
1976-Burdet H Heinemann
1977-Elmer H. Marth
1978-James B. Smathers
1979-Joseph Edmondson
1980-James R. Welch
1981-Francis F. Busta

In 1982 this award was split into the Educator Award and the Harold Barnum Award (for industry).

EDUCATOR AWARD

1982-Floyd Bodyfelt
1983-John Bruhn
1984-R. Burt Maxcy
1985-Lloyd B. Bullerman
1986-Robert T. Marshall
1987-David K. Bandler
1988-Edmund A. Zottola

HAROLD BARNUM AWARD

1982-Howard Ferreira
1983-C. Dee Clingman
1984-Omer Majerus
1985-William L. Arledge
1986-Hugh C. Munns
1987-J. H. Silliker
1988-Kenneth Kirby

CITATION AWARD

1951-J. H. Shrader and
William B. Palmer
(posthumously)
1952-C. A. Abele
1953-Clarence Weber
1954-C. K. Johns
1955-R. G. Ross
1956-K. G. Weckel
1957-Fred C. Baselt
1958-Milton R. Fisher
1959-John D. Faulkner
1960-Luther A. Black
1961-Harold S. Adams
1962-Franklin W. Barber
1963-Merle P. Baker
1964-W. K. Moseley
1965-H. L. Thomasson
1966-J. C. Olson, Jr.
1967-William V. Hickey
1968-A. Kelley Saunders
1969-Karl K. Jones
1970-Ivan E. Parkin
1971-L. Wayne Brown
1972-Ben Luce
1973-Samuel O. Noles
1974-John C. Schilling
1975-A. R. Brazis
1976-James Meany
1977-None Given
1978-Raymond A. Belknap
1979-Harold E. Thompson, Jr.
1980-Don Raffel
1981-Henry V. Atherton
1982-None Given
1983-William B. Hasting
1984-Elmer H. Marth
1985-Ralston B. Read, Jr.
1986-Cecil E. White
1987-None Given
1988-Carl Vanderzant

SANITARIANS AWARD

1952-Paul Corash
1953-E. F. Meyers
1954-Kelley G. Vester
1955-B. G. Tennent
1956-John H. Fritz
1957-Harold J. Barnum
1958-None Given
1959-William Kempa
1960-James C. Barringer
1961-Martin C. Donovan
1962-Larry Gordon
1963-R. L. Cooper
1964-None Given
1965-Harold R. Irvin
1966-Paris B. Boles
1967-Roger L. Stephens
1968-Roy T. Olson
1969-W. R. McLean
1970-None Given
1971-Shelby Johnson
1972-Ambrose P. Bell
1973-None Given
1974-Clarence K. Luchterhand
1975-Samuel C. Rich
1976-M. W. Jefferson
1977-Harold Bengsch
1978-Orlowe Osten
1979-Dr. Bailus Walker, Jr.
1980-John A. Baghott
1981-Paul Pace
1982-Edwin L. Ruppert
1983-None Given
1984-Harold Wainess
1985-Harry Haverland
1986-Jay Boosinger
1987-Erwin P. Gadd
1988-Kirmon Smith

HONORARY LIFE MEMBERSHIP AWARD

1957-J. H. Shrader
1958-H. Clifford Goslee
1959-William H. Price
1960-None Given
1961-Sarah Vance Dugan
1962-None Given
1963-C. K. Johns and Harold Macy
1964-C. B. and A. L. Shogren
1965-Fred Basselt and Ivan Parkin
1966-M. R. Fisher
1967-C. A. Abele and L. A. Black
1968-M. P. Baker and W. C. Frazier
1969-John Faulkner
1970-Harold J. Barnum
1971-Wiliam V. Hickey
1972-C. W. Dromgold and
E. Wallenfeldt
1973-Fred E. Uetz
1974-H. L. Thomasson and
K. G. Weckel
1975-A. E. Parker
1976-A. Bender Luce
1977-Harold Heiskell
1978-Karl K. Jones
1979-Joseph C. Olson, Jr.
1980-Alvin E. Tesdal
1981-Robert M. Parker
1982-None Given

and Past Presidents

1983-Orlowe Osten
1984-Paul Elliker
1985-Patrick J. Dolan, Franklin W. Barber and Clarence K. Luchterhand
1986-John G. Collier
1987-Elmer Marth and James Jezeski
1988-Kenneth Whaley and Paul J. Pace

SHOGREN AWARD

1972-Iowa Affiliate
1973-Kentucky Affiliate
1974-Washington Affiliate
1975-Illinois Affiliate
1976-Wisconsin Affiliate
1977-Minnesota Affiliate
1978-None Given
1979-New York Affiliate
1980-Pennsylvania Affiliate
1981-Missouri Affiliate
1982-South Dakota Affiliate
1983-Washington Affiliate
1984-None Given
1985-Pennsylvania Affiliate
1986-None Given
1987-New York Affiliate
1988-Wisconsin Affiliate

MEMBERSHIP ACHIEVEMENT AWARD

1986-Iowa Affiliate
1987-Florida Affiliate
1988-Florida Affiliate

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1912-C. J. Steffen
1913-C. J. Steffen
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1917-Wm. H. Price
1918-Alfred W. Lombard
1919-James O. Kelly
1920-Ernest Kelly
1921-C. L. Roadhouse
1922-H. E. Bowman
1923-Geo. E. Bolling
1924-J. B. Hollingsworth
1925-T. J. Strauch
1926-G. C. Supplee
1927-W. A. Shoults
1928-Ira V. Hiscook
1929-H. R. Estes
1930-R. E. Irwin
1931-A. R. B. Richmond
1932-W. B. Palmer
1933-H. N. Parker
1934-P. F. Krueger
1935-C. K. Johns
1936-G. W. Grim
1937-J. C. Hardenbergh
1938-A. R. Tolland
1939-V. M. Ehlers
1940-P. D. Brooks
1941-L. C. Frank
1942-F. W. Fabian
1943-C. A. Abele
1944-C. A. Abele
1945-R. R. Palmer
1946-R. R. Palmer
1947-R. G. Ross
1948-W. D. Tiedeman
1949-A. W. Fuchs
1950-M. R. Fisher
1951-K. G. Weckel
1952-H. L. Thomasson
1953-H. J. Barnum
1954-John D. Faulkner
1955-I. E. Parkin
1956-Harold S. Adams
1957-Paul Corash
1958-Harold Robinson
1959-Franklin Barber
1960-W. V. Hickey
1961-John Sheuring
1962-Charles E. Walton
1963-Ray Belknap
1964-John H. Fritz
1965-W. C. Lawton
1966-Fred E. Uetz
1967-P. R. Elliker
1968-A. N. Myhr
1969-Samuel O. Noles
1970-Milton E. Held
1971-Dick B. Whitehead
1972-Orlowe M. Osten
1973-Walter F. Wilson
1974-Earl O. Wright
1975-P. J. Skulborstad
1976-H. E. Thompson, Jr.
1977-H. V. Atherton
1978-David F. Fry
1979-Howard Hutchings
1980-Bill Kempa
1981-William Arledge
1982-Harry Haverland
1983-Robert Marshall
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1986-Sidney E. Barnard
1987-Roy Ginn
1988-Leon Townsend

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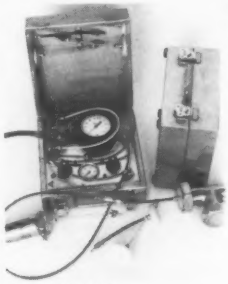

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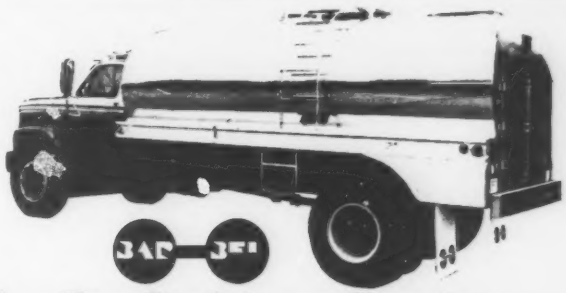

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CIRCLE READER SERVICE NO. 359

Amendments To 3-A Sanitary Standards For Multiple-Use Plastic Materials Used As Product Contact Surfaces For Dairy Equipment

Number 20-15

Formulated by
International Association of Milk, Food and Environmental Sanitarians
United States Public Health Service
The Dairy Industry Committee

The "3-A Sanitary Standards for Multiple-Use Plastic Materials Used as Product Contact Surfaces for Dairy Equipment, Number 20-14," are hereby further amended as indicated in the following:

Section I. Standards for Acceptability, sub-paragraph (2): Add the following materials to the list of Generic Classes of Plastics:

	Maximum Percent of Weight Gain		
	Cleanability Response (Section F Regimen)	Product Treatment (Section G Regimen)	
		Solution I	Solution J
Polyethylene Phthalate Polymers*	0.10	0.15	0.25

*covered by 21 CFR 177.1630

These amended standards shall become effective March 1, 1989.

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Coming Events

1989

JANUARY

•**23-27, Insect Fragment Seminar,** Okumura Biological Institute, Clarion Hotel, Sacramento, CA. Contact: George Okumura, 6669 14th St., Sacramento, CA 95831 (916) 421-8963.

•**24-25, Second Annual South California Food Industry Conference** will be held on the campus of Chapman College in Orange, CA. For more information, contact: Walt Clark, Chapman College, Food Science and Nutrition Dept., Orange, CA 92666 714/997-6869.

•**30-1, International Exposition for Food Processors (IEFP)** to be held in Anaheim, California. For more details as well as complete information on attending, contact: FPM&SA, 200 Daingerfield Road, Alexandria, VA 22314 or call 800-331-8816 (in VA call 703/684-1080).

FEBRUARY

•**1-3, Southeastern Poultry & Egg Association** to be held in Atlanta, GA. For more information, contact: Larry Singleton, 404/377-6465.

•**9-11, National Mastitic Council 28th Annual Meeting** to be held at the Hyatt Regency Tampa, Two Tampa City Center, Tampa, FL 33602.

•**13-16, Freezing Technology Course** for the Frozen Food Indsutry to be held at the University Club, University of California, Davis. For further information, contact: Robert C. Pearl or Ann Sandoval, Food Science & Technology Dept., University of California, Davis, CA 95616 916/752-0981.

•**14-15, Oregon Dairy Industries Annual Conference,** Hilton Hotel, Eugene, Oregon. For more information, contact: June Daley 503/754-3271 or Floyd Bodyfelt 503/754-3463, Dept. of Food Science & Technology, Oregon State University, Corvallis, OR 97331.

•**15-16, Dairy & Food Industry Conference,** the Ohio State University, Dept. of Food Science & Nutrition, 2121 Fyffe Road, Columbus, OH 43210-1097. Contact: John Lindamood 614/292-6281.

•**17, Georgia Association of Food and Environmental Sanitarians 3rd Annual Meeting,** Snapfinger Woods Drive Holiday Inn, Decatur, Georgia. For more information contact Steve Petrides, GAFES Secretary, DeKalb County Board of Health, Division of Environmental Health, 3651 Market Street, Clarkston, Georgia 30021, (404) 292-1979.

•**20-22, ABC Research 15th Annual Technical Seminar,** Hilton Hotel, Gainesville, FL 32608. For additional information, contact: Sara Jo Atwell, 904/372-0436.

•**21-Mar. 3, A one-day seminar,** held at locations throughout the U.S., aimed at informing the decision makers in the food industry of the advantages of automated microbiology. The seminar will include discussions of the practical and financial benefits of automated conductance microbiology as well as examples of presently used applications by the food industry. For more information on seminar locations contact: Dave Cousins at 800-321-9484; in Ohio, 216/871-8900.

26-Mar. 1, Shellfish Institute Annual Convention to be held at the Inter-Continental Hilton Head HOtel, Hilton Head, SC. For additional information, contact: SINA headquarters at 202/296-5170.

MARCH

•**12-15, American Cultured Dairy Products Institute Annual Meeting and Conference/Cultures and Curds Clinic/International Cultured Dairy Products Evaluation Session,** Marriott River Center, San Antonio, Texas. For more information, contact Dr. C. Bronson Lane, ACDPI, PO Box 547813, Orlando, FL 32854-7813 407/628-1266.

•**13-16, UCD/FDA Better Process Control School,** University of California. Contact: Robert C. Pearl, Dept. of Food Science & Technology, University of California, Davis, CA 95616 916/752-0980

•**19-21, Innovations in the Aseptic Processing of Particulates** to be held in Indianapolis. For information, contact: James V. Chambers, Food Science Dept., Smith Hall, Purdue University, West Lafayette, IN 47907 317/494-8279.

•**20-24, Mid-West Workshop in Food Sanitation,** the Ohio State University, Dept. of Food Science & Nutrition, 2121 Fyffe Rd., Columbus, OH 43210-1097. Contact: David Dzurec 614/292-6281.

•**22-24, Michigan Environmental Health Association,** Holiday Inn, Holidome & Conference Center, Ann Arbor, MI. For more information, contact: Ike Volkers, MDPH, 3500 N. Logan, Lansing, MI 48908 517/335-8268.

•**28-30, Western Food Industry Conference** to be held at the University of California, Davis, CA. For more information, contact: Robert Pearl 916/752-0981 or Shirley Rexroat 916/752-2191.

•**29-30, The Center for Dairy Research at the University of Wisconsin-Madison** will be holding its annual Cheese Resarech and Technology Conference at the Holiday Inn East, Madison, WI. For more information, contact: Sarah Quinones 608/262-2217.

APRIL

•**5-7, Missouri Milk, Food and Environmental Health Association will hold its annual meeting** in Columbia at the Ramada Inn, 1100 Vandiver Drive. For more informa-

tion concerning the conference, contact: Greg Fast, MO DOH, NE District, 250 E. Patton, Macon, MO 63552, 816/385-3125.

• **12, 38th Annual University of Maryland Ice Cream Conference.** For more information, contact: Dr. James T. Marshall, Dept. of Animal Sciences, University of Maryland, College Park, MD 20742 301/454-7843.

• **12-14, California Environmental Health Association Annual Educational Symposium,** will be be held at the Red Lion Inn, Costa Mesa, California. For more information contact: Donna Vilalta, Riverside County Environmental Health, 46209 Oasis Ave., Indio, California 92201, Room 207, 619/342-8875.

• **17-20, Better Process Control School** to be held at Purdue University. For information, contact: James V. Chambers, Food Science Dept., Smith Hall, Purdue University, West Lafayette, IN 47907 317/494-8279.

MAY

• **15-18, Aseptic Processing and Packaging Workshop.** Enrollment is limited to 40 for this class to be held at Purdue University. For information, contact: James V. Chambers, Food Science Dept., Smith Hall, Purdue University, West Lafayette, IN 47907 317/494-8279.

JUNE

• **13-15, Hazardous Materials Management International Conference and Exhibition '89** will be held at the Atlantic City Convention Center, Atlantic City, New Jersey. For additional information, contact: Mary Jo McGuire, Group Show Director, Tower Conference Management Co., 800 Roosevent Rd., Bldg E -- Suite 408, Glen Ellyn, IL 60137-5835 312/469-3373.

AUGUST

• **14-18, Biotechnology: Principles and Processes** to be held at the Massachusetts Institute of Technology, Cambridge, Massachusetts. For more information, contact: Director of Summer Session, MIT, Room E19-356, Cambridge, MA 02139 or Anthony J. Sinskey, Dept. of Biology, MIT, Cambridge, MA 02139 617/253-6721.

SEPTEMBER

• **19-21, New York Association of Milk and Food Sanitarians will hold its annual meeting** in Buffalo at the Sheraton-Buffalo Airport Hotel. For information concerning the meeting, contact: Paul Dersam, 27 Sullivan Rd., Alden, NY 14004, 716/937-3432.

• **27-29, Liquitec Expo '89.** For more information contact: Carolyn Mesce, Marketing Manager, Liquitec Expo Inc., PO Box 630, West Paterson, New Jersey 07424 201/256-0011.

NOVEMBER

• **11-15, Dairy and Food Industries Supply Assoc., Inc.** McCormick Place, Chicago, Illinois.

1990

DECEMBER

• **12-18, American Society of Agricultural Engineers** will be sponsoring the International Symposium on Agricultural and Food Processing Wastes. For more information contact: Jon Hiler, American Society of Agricultural Engineers, 2950 Niles Road, St. Joseph, MO 49085 616/429-0300.

COURSES & SEMINARS

SILLIKER'S Short Course
"*Listeria:* Detection, Identification, and Other Considerations"

February 21-23, 1989

Students will learn and use the USDA(FSIS) and the FDA culture methods for detection of *Listeria* and receive hands-on instruction on the DNAH and EIA rapid methods. Material on virulence testing and laboratory safety considerations will be covered in detail.
Contact **Dolores A. Jurick** (312) 756-3210

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From the Ames Office . . .

By
Kathy R.
Hathaway

This is it! The NEW "Dairy, Food and Environmental Sanitation" has experienced extensive cosmetic surgery reflected in this issue. Inside you'll notice format changes which we hope will make the journal more eye appealing, and easier to read with bolder headings.

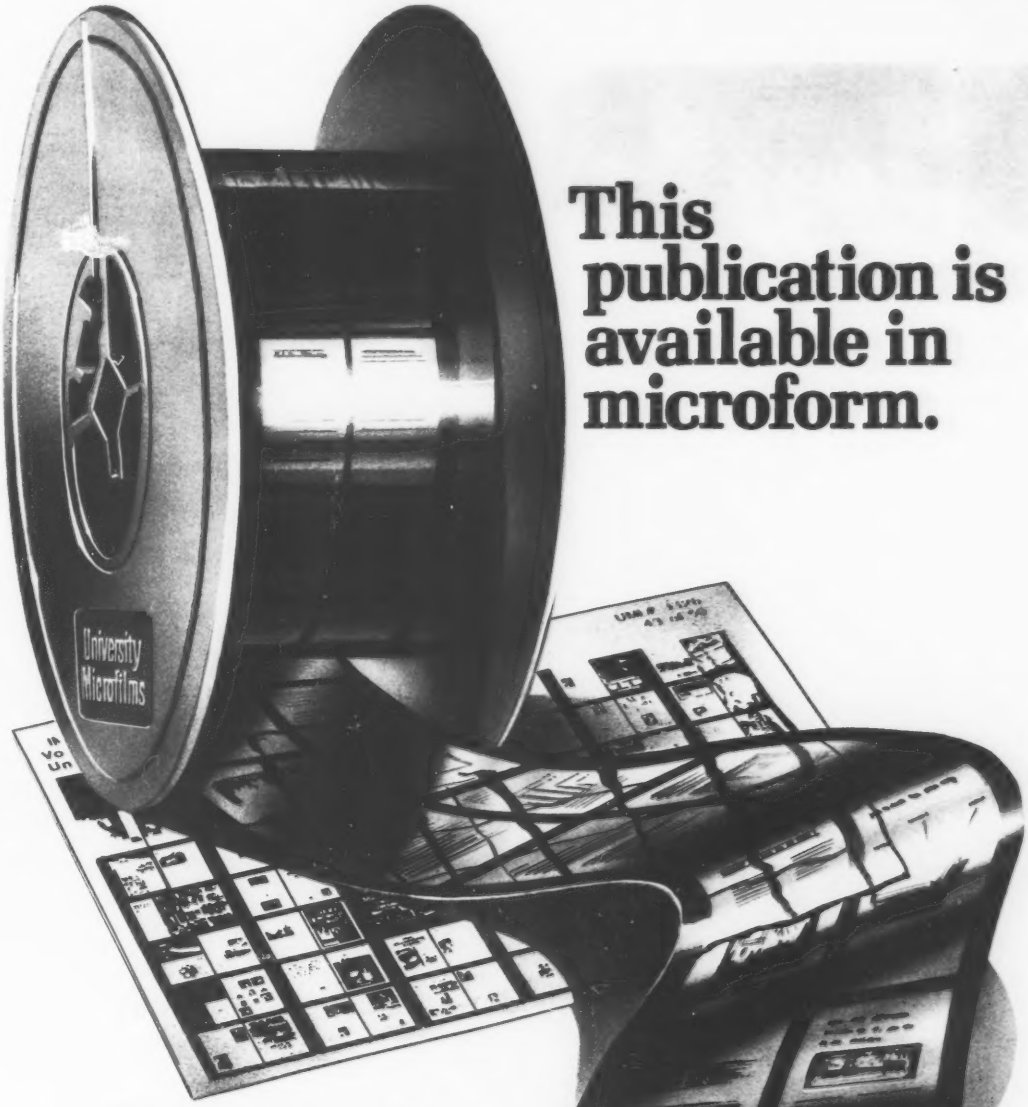
The cover is also new, with a different 4-color scenic photo on each upcoming issue. A scenic photo was chosen for each cover, eliminating depicting only one of three areas of concern. Since the journal does cover all three areas: dairy, food and environmental, the name was changed to reflect the contents. Every issue of Dairy, Food and Environmental Sanitation attempts to reach all readers, therefore we do not devote an entire issue to any one subject which would leave out a portion of our readers. On the Table of Contents page you'll find a short paragraph explaining the photo on the front cover.

We look forward to your comments and suggestions concerning Dairy, Food and Environmental Sanitation.

Registration forms for the 76th IAMFES Annual Meeting will be available in both journals, beginning with the February issue. This year for the first time, advanced registration will be handled through the Ames office. Master Card, Visa, or American Express will be accepted for registration in addition to check or money order. You may also FAX your registration form if you wish: 515-232-4736. The FAX is on a dedicated line, on 24 hours, 7 days a week so that you may FAX at anytime without calling the office number first. You will receive confirmation when your meeting registration is received.

Nominations for the IAMFES Awards are now being accepted. Completed forms need to be in the Ames office by April 1, 1989. Check this issue for complete details on the 1989 IAMFES Awards.

Those renewals that were received by the end of 1988 are on from January 1989 through December 1989. If you haven't renewed yet, please do so now. Your first issue will be the February issue if your renewal is received before the end of this month. Your membership will then expire January 1990.



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